

Getting started in

DIGITAL PHOTOGRAPHY

IMPROVE YOUR PHOTO SKILLS AND TAKE BETTER PICTURES

INSIDE



**TAKE BETTER
LANDSCAPES**



**UNDERSTAND
YOUR CAMERA**



**MASTER FLASH
PHOTOGRAPHY**



**GET CREATIVE
WITH FILTERS**



Welcome...



"IF YOU'VE RECENTLY started using a digital SLR or Compact System Camera, you have taken a major step towards shooting better pictures. Boasting an incredible level of versatility, delivering superb image quality and forming the heart of a system that can be expanded with lenses, flashguns and various other accessories, these interchangeable-lens cameras have led to a revolution in photography. While these cameras are relatively easy to use for 'snapshot' photography, the truth is that getting the very best from your kit and, more importantly, developing the creative side of your photography, requires some time and dedication to learning new techniques and skills. The good news is that *Getting Started in Digital Photography*, produced by the experts at *Digital SLR Photography* magazine, is packed with information, advice and techniques that will help you become a better photographer. If you've ever looked at images from the professionals and wondered how they managed to get such great results, then this guide is for you. We've covered all the key areas of photography, from landscapes to portraits using daylight or flash, and provided tried-and-tested practical techniques for shooting stunning images, along with expert advice to choosing the best gear (including brilliant budget options) and pages of inspiring images to get your creative juices flowing. Good luck with your photography. All the best!"

DANIEL LEZANO, EDITOR

Meet our digital photography experts

All our experts are team members or regular contributors to *Digital SLR Photography* magazine. For more expert advice and inspiration, pick up the latest issue, available on the second Tuesday of every month. For further information, visit the magazine's website at www.digitalslrphoto.com



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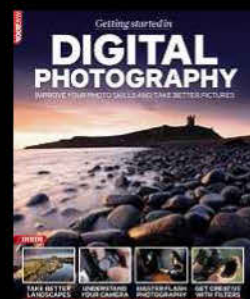
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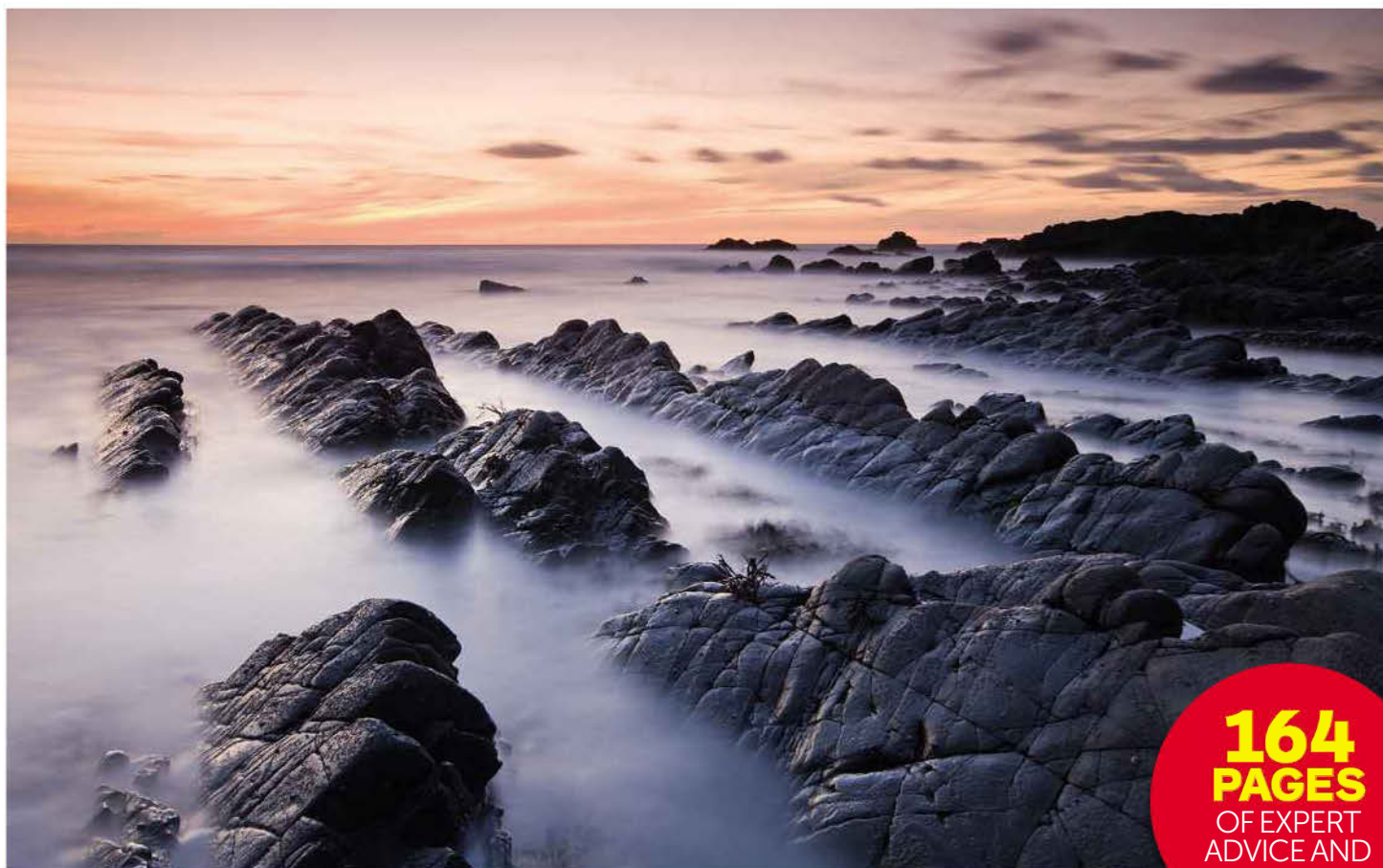
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OUR FANTASTIC SUBSCRIPTION OFFERS

Interchangeable lens cameras

Understanding how your camera works is key to getting the best from it. We take a look at the main features you'll find on digital SLRs and Compact System Cameras

UNTIL VERY RECENTLY, if you wanted a digital camera with interchangeable lenses, then your choice was easy: most of us would opt for a 35mm-based digital SLR (while a minority of pros chose a medium-format DSLR costing tens of thousands of pounds). However, in the last couple of years, Compact System Cameras (CSCs), also commonly known as mirrorless cameras, have come on to the scene, offering an alternative option.

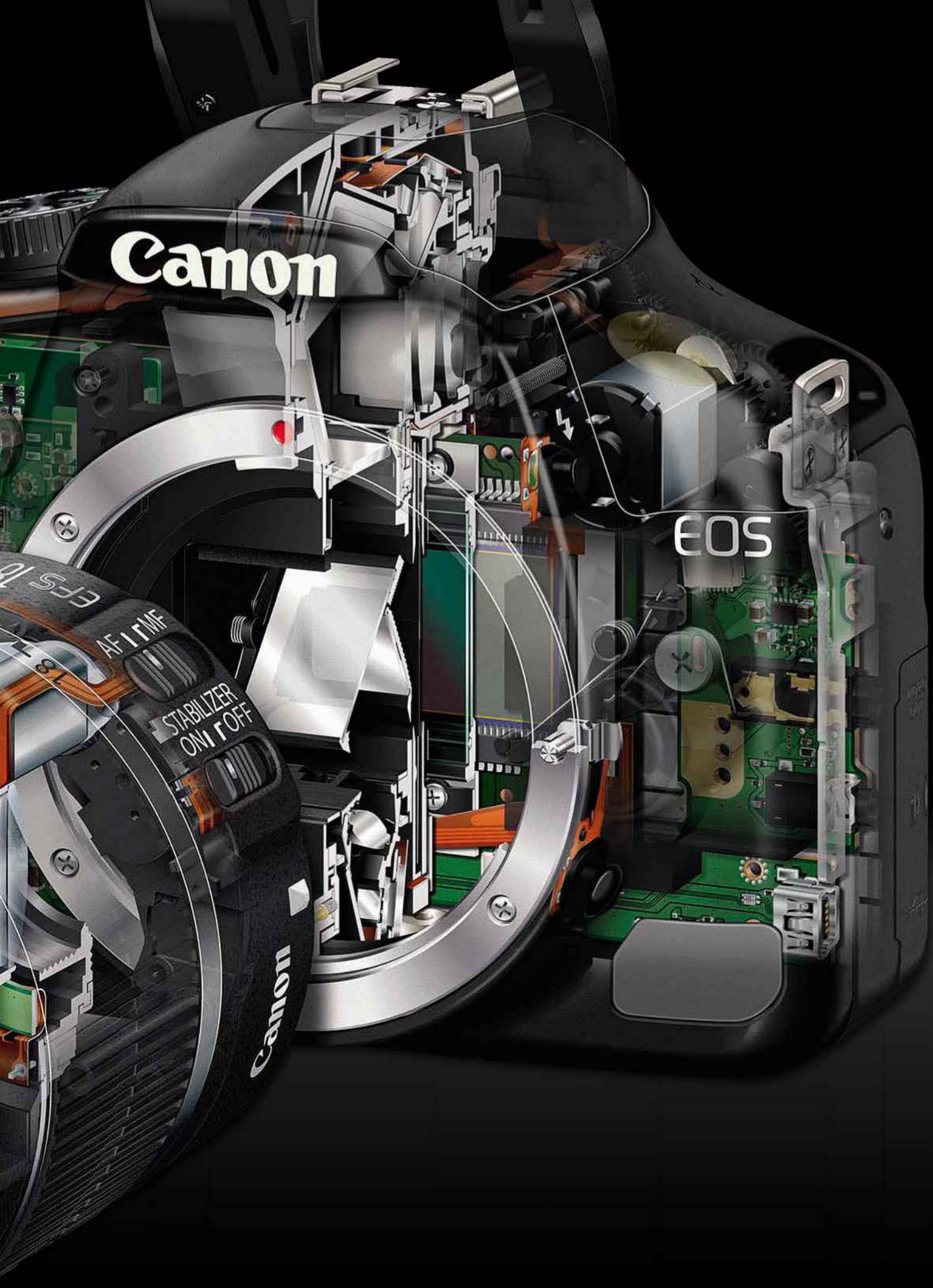
This latest generation has many similarities to DSLRs, offering virtually identical specifications and operating in a similar manner, albeit with one or two major differences. The handling, features and performance of digital SLRs have been refined and improved over the years so that users find them as simple as possible to operate. It makes sense then, since most manufacturers of CSCs also produce digital SLRs, that CSCs feature similar operating systems to their SLR counterparts. Not only does this mean CSCs have the potential to be great performers as the technology is already quite advanced, but it makes the crossover from DSLRs to CSCs fairly easy for those who want to make the transition.

In this section of the guide, we'll be looking at all the key features of your digital camera, explaining what they do and how you should use them to improve the quality of your images. We'll also be comparing and contrasting the two main interchangeable-lens camera systems. As you'll discover, both share many common areas and only a few practical differences. In this guide, we explore the camera's main functions in-depth and look in detail at the heart of every digital camera: the image sensor.

Know your camera inside & out!

Digital cameras boast an incredible amount of technology. Our guide aims to explain all the key features and reveal a few secrets, too.





Canon

EOS

EOS
AF/ MF
STABILIZER
ON/OFF
Canon

Anatomy of an interchangeable-lens camera

Find your way around your digital camera with our annotated guide. As you'll discover, there are more similarities than differences between a DSLR and a CSC!

REGARDLESS OF WHETHER you're using a digital SLR (DSLR) or a 'mirrorless' Compact System Camera (CSC), you have in your possession an incredibly impressive piece of equipment. Your camera is packed with cutting-edge technology designed to deliver perfect images for the vast majority of shooting situations, as well as, more recently, HD video. Despite all these features, the cameras are also designed to be as easy to use as possible, with some models managing to be simpler to use than others. That said, with so much on offer, it's easy to get confused as to the purpose of some functions, or to totally overlook useful facilities that could make your life easier. No problem: we're here to help. Our informative guide covers everything you need to know to get the most from your camera and, more importantly, help you take better pictures.

DID YOU KNOW?

With your camera set to single-shot AF and single frame advance, once you have pressed the shutter release to take the initial image, releasing it only to the halfway stage locks the AF and exposure settings for the next shot you take.



Key features and controls found on DSLRs & CSCs

1) Shutter release button: The shutter button has a two-stage action – press halfway to activate the AF and metering systems and fully depress to take the exposure.

Did you know? If you've left your camera switched on for a few minutes and it's entered standby mode to preserve battery power, tap the shutter release gently to switch it back on. Also worth noting is that many cameras have a custom function that can set whether the shutter release locks AF, exposure or both.

2) Integral flash: Found on the vast majority of cameras. However, a few top-end DSLRs and some CSCs lack this facility, catering for flash via the hotshoe mount only. Many CSCs lacking an integral flash have a small clip-on unit supplied along with the camera. Flash coverage is usually

good enough for a moderate wide-angle lens and subjects within a couple of metres away. All offer a choice of flash modes. Auto is fine for capturing standard low-light portraits, but a number of flash modes allow for far more creativity, including slow-sync and rear-curtain sync.



3) Flash-up button: Press to pop up the integral flash (if your camera has one).

While some cameras automatically raise the flash when required in certain fully automatic modes, all require you to activate them manually should you wish to use them in a semi-auto or manual exposure mode.

Did you know? With some cameras, you can press and hold the Flash-up button to access additional modes, rather than

using the menu system to do this. With some models, a separate flash mode button on the four-way control is used for this.

4) AF illuminator lamp: In low light, your camera can struggle to focus. The AF lamp, housed in the integral flash or on the front of the camera body, fires a flash burst or a patterned beam of light to help the AF lock on the subject.



5) Lens release button: Press to allow the lens to be removed.

Did you know? Nikon lenses are removed in the opposite direction to other brands.



6) AF/M: This switch, found on the lens or the camera body, is used to set the focusing to manual or autofocus.

7) Self-timer lamp: Visually indicates self-timer countdown.

8) Microphone: Records audio when shooting movies. Can also be used on some cameras to 'write' audio notes to images.



9) Depth-of-field preview: Less common than with film SLRs.

Using it closes the lens iris to the selected aperture, allowing you to preview the extent of depth-of-field in the viewfinder. However, this darkens the viewfinder image, making it tricky to use, especially with small apertures. Electronic viewfinders boost the brightness when using depth-of-field preview, which is an advantage over optical viewfinders.

Did you know? Canon users can use this function with LiveView, allowing depth-of-field to be more easily assessed on the monitor than the viewfinder.



10) Main dial: Arguably the most important control on your camera as it is used to set the exposure mode. Some have a central locking system, but most haven't, so before shooting, be sure it hasn't been nudged to a mode you don't wish to use.

Did you know? Many semi-pro/pro DSLRs use a button instead of a dial to set the exposure mode.

11) Hotshoe: Also known as an accessory shoe, this allows you to fit a flashgun to your camera. These flashguns provide additional power and features and give you far greater scope with your flash photos. As well as a flashgun, you can attach other accessories, such as a control unit for syncing multiple flash set-ups and remote triggers. The central contact fires the flash, the others are used to transfer information.

Did you know? The unconventional design of the Sony hotshoe is based on the Minolta Dynax hotshoe, introduced in 1988.

12) On/off switch: Turn the camera on or off with this switch. If you leave it to the On position accidentally, the camera will normally switch off the power after five minutes if unused. Press the shutter release gently to switch the camera back on.

13) Display: Your camera uses a default exposure display on its monitor. Pressing the display button changes the format: bringing up the histogram, changing the colour of the screen display or switching it off.

14) ISO: The ISO rating determines the 'sensitivity' of your sensor to light, much like film speeds in the past. A low ISO rating has less

sensitivity, but delivers better image quality. Once you increase the ISO rating, the amount of signal 'noise' increases, leading to a loss in quality (mainly in terms of colour reproduction and sharpness), which is most apparent at speeds of around ISO 800 and above. Recent models offer better noise

handling than older models.

15) Input dial: This is usually placed close to the shutter release or by the thumbrest on the rear. It's an important dial that is used to change variables such as the shutter speed or aperture.

16) Sensor plane marker: This marking provides a visual marker as to where the sensor plane is.



Key features and controls found on DSLRs & CSCs

1) Exposure compensation: The most commonly used exposure override. Increases or decreases the exposure by a set amount, usually in 1/3 or 1/2-stop increments. With experience, you'll discover how its use suits certain scenes, such as adding +2 stops when shooting snow or setting a negative value (-2 to -3 stops) when using flash to darken the background for added mood. When shooting in manual mode, pressing this button allows the aperture to be changed.

Did you know? Most cameras have a function that lets you set whether changes are made in 1/2, 1/3 or full-stop increments.

2) Shortcut button: Shortcut buttons are increasingly common, giving fast access to key features via the LCD monitor and four-way control. For instance, press Canon's Q (Quick) button and you can quickly access the aperture/shutter speed, ISO rating, Picture Style, White Balance and exposure compensation, to name a few. On some models from Pentax and Nikon, a similar function is performed by the i/Info button, while other brands, such as Sony, offer a Fn (function button) that allows for shortcuts.

3) Viewfinder: Digital SLRs offer Through The Lens (TTL) viewing, so what you see in the viewfinder is an image coming directly through the lens. Sony's Alpha DSLTs (eg the A58, A65 and A77)

have an electronic finder, as do CSCs that sport a viewfinder. We cover viewfinders in more detail on p13.

4) AF point selection: Multi-point AF is found on all cameras, helping with focus on off-centre subjects. This button lets you switch between multi-point AF or switch to single-point AF. Choosing one point only is useful in situations when you need precise control of the focus, such as with portraits when you need to be certain to focus on the subject's eye. The central AF point normally boasts the most precise AF sensor, making it the best choice.

5) Menu: Press to access all of the camera's functions. It's worth navigating the menu system and learning its set-up when you first get the camera. All use a series of sub-menus/tabs split into various categories to make life easier.

6) Image processing lamp: This lights up when images are being transferred from the camera to the memory card.

7) AE-Lock: This popular override is particularly useful when you need to work quickly as it's fast to set. Use it to take and lock a meter reading from a mid-tone when shooting in tricky lighting situations. Useful when shooting a backlit subject.

Did you know? You can use AE-Lock with any metering pattern, but it's best to switch to the spot/partial or centre-

weighted average pattern, rather than using it with multi-zone metering.

8) Four-way control: Virtually every new DSLR and CSC boasts a four-way control system on its rear, as a fast and versatile way to set key functions. Each button has its own primary function, but the four-way set-up allows the same buttons to be used with the menu display to scroll through the navigation system.

9) White Balance: As well as the default Auto White Balance (AWB) setting, your camera has a number of presets for different lighting conditions. Setting the best-matched preset will ensure more accurate colours. You can also set a custom White Balance yourself using a grey card. With experience you'll discover how setting an incorrect WB setting can lead to creative results.

10) Picture Styles: As well as the standard setting, your camera has a number of picture settings optimised for certain types of subject, such as portraits, landscapes and so on. You can also customise some settings to suit your own preferences.

11) Frame advance: The standard setting for your camera is to shoot a single frame with every press of the shutter button. However, it can be set to shoot continuous. You can also delay the exposure being taken by setting the two/ten-second

self-timer, which is ideal when you want to be in the picture yourself. The two-second self-timer is used to reduce the risk of shake when using a long exposure. You can also use this button when you want to shoot using a remote release.

12) AF button: Your camera offers at least two main autofocus modes: single-shot AF for static subjects and servo/continuous AF for moving subjects. Many also have an AI Servo/Auto-AF mode, which works like single-shot until subject movement is detected, when it switches automatically to continuous focus.

13) Movie mode: Fancy shooting video rather than taking stills? That's no problem for the latest DSLRs and CSCs that shoot high-quality movies, most in Full HD. A variety of formats and settings are available to suit amateur and professional use.

14) Image magnification: The magnifying glass symbols are found on virtually every camera. They highlight the buttons that are used to zoom in to images to check sharpness when reviewing images or using LiveView. Once zoomed in, the four-way control is used to move around the magnified image.

15) Playback: Use this to review images on your memory card.

16) Delete: Press this while in Playback mode to delete the currently displayed image.



The LCD monitor

With a number of key roles, the importance of the LCD monitor should not be underestimated, as you'll be using it on a regular basis. Here are the essential facts to consider.

- **Screen size:** Most current cameras have a screen size of at least 3in. The larger the screen the better, as it makes it quicker to navigate the menu system and easy to review images or use LiveView.
- **Screen resolution:** The resolution, stated in dots, is important as the higher it is, the sharper the display. Most monitors have a 460,000-dot screen, which is very good, but way short of the sharpness and clarity of screens that boast 920,000 or more dots.
- **Vari-angle monitors:** While most screens are fixed, articulated monitors are becoming common due to their usefulness when using LiveView or when shooting movies.
- **Menu system:** The many control buttons on your camera allow you to quickly select most key modes and functions, but it's the camera's menu system that allows you access to every feature on the camera. Every menu has sub-divisions or 'tabs' for the various types of functions they control, making it easier and quicker to access the function you want. Canon and Nikon are generally regarded as having the best designed menus, but all are easy to use once you've played with them for a little while.

- **Exposure information:** The default setting for the monitor is to show the key exposure information on the screen. You can usually customise the layout and colours to your liking, so check your camera's instruction manual or explore the menu system a little to see what options are available.
- **Screen brightness:** Many users aren't aware that their camera's menu system offers an option that allows the brightness of the display to be adjusted. Set it to your liking – most people boost brightness when shooting in bright conditions, reduce it in low light and use a mid-setting in studio conditions or when checking exposure accuracy.
- **Touchscreen functionality:** A feature of an increasing number of DSLRs and CSCs that allows you to select mode, focus and fire the shutter by pressing the icons on the monitor screen.
- **Quick Guides:** A feature that is becoming increasingly common is the Quick Guide. Found predominantly on entry-level models, it provides illustrated instructions for various picture-taking skills.
- **Monitor hood:** Bright daylight makes it difficult to view the monitor, even with more recent models that boast displays with



better anti-glare performance. A simple and inexpensive way to improve your viewing of the screen is to attach a monitor hood, which shields direct light from reaching the screen. With some CSCs lacking a viewfinder and having the monitor as the only method for composing images, using a hood can make a major difference.

- **Screen construction:** The vast majority of monitors use a Liquid Crystal Display (LCD), but a number use different materials that are claimed to offer even brighter colours and better anti-glare performance. These include Samsung's AMOLED (Active Matrix Organic Light Emitting Diode) and the



OLED (Organic Light Emitting Diode) screen used on some Olympus CSC models.

- **LiveView:** This lets you use the monitor to frame the scene. With some cameras, when critical focusing is needed, part of the image can be magnified to allow for fine-tuning of the focus. While the AF performance of LiveView used to be poor, more recent cameras have shown a marked improvement. Sony Alpha's LiveView system, along with the latest Olympus and Panasonic CSCs, boasts excellent LiveView AF. However, while monitors are sharp and offer good contrast, they are still difficult to use in bright lighting conditions, so we advise using an LCD shade.



Compartments & connections

1) Battery: A few cameras use AA batteries, but the majority use lithium-ion batteries. These are rechargeable and last for several hundred frames, but are more expensive if you need a spare.

Did you know? Independent brands like Hähnel, Delkin and Hama produce compatible lithium batteries considerably cheaper than branded batteries.

2) Accessory grip: It's worth noting that many cameras allow optional grips to be attached. These offer a number of advantages as follows:

Handling: The additional grip provides a more solid hold, which is particularly useful when using the camera in portrait format. Bear in mind that it also means you've a larger and heavier outfit to carry.

Additional function buttons:

The grip has a secondary set of buttons that duplicate those on the body and again help when shooting in portrait format. These are usually made up of the following: shutter release, input dial, exposure compensation, AF point selection and AE-Lock.

Additional power: The grip holds additional batteries, which allows for extended shooting. Many grips allow the use of lithium-ion batteries and have an adaptor to allow AA batteries to be used, too.

3) Tripod bush: A 1/4in thread bush is located on the bottom of every camera and is a standard size for use with tripods and

monopods, as well as other camera supports.

4) Card slot: Most cameras feature a card slot, protected by a hinged door, on the right side of the camera. Better-specified models have a twist-lock security switch to prevent it accidentally opening. Placing the card slot in the battery compartment on the camera base is becoming common, but we're not so keen on this position as it causes access problems when your camera is on a tripod. Some cameras offer two slots, boosting capacity and allowing you to set up the camera to transfer video to one slot and still images to the other, or do a similar thing with Raw and JPEG files.

5) Camera connections: The following are the most popular connection sockets:
HDMI: Plug your camera directly into your HDTV and view images and movies on the big screen.

Remote: Connect a corded remote and shoot night exposures with less risk of camera shake.

USB: Connect your camera directly to a computer or a compatible inkjet printer.

Mic: When shooting video, plug in an external microphone to greatly improve audio quality.
PC socket: Found on the front of many enthusiast and pro-spec cameras, this accepts the standard sync lead for use with studioflash.

How size and weight relate to build quality

All cameras are made to a very high standard, but some are made to a higher standard than others, so it's worth noting how build quality varies as you spend more.

Budget entry-level models are made to be as small and light as possible, hence they have a mainly polycarbonate body that feels somewhat plasticky compared to rivals.

Mid-range cameras are designed for heavier use and so are more sturdy, often having an alloy chassis to improve strength. Some have enhanced weatherproofing, too.

Pro models use a steel or magnesium alloy chassis and shell for maximum protection. All areas of the camera, from the reinforced shutter system to the weatherproof seals around the buttons and dials, are made as durable as possible. The outcome of this is that the cameras are bigger and heavier.





The viewfinder

The viewfinder is important as, for most photographers, it's how the image is framed. Its size and clarity improves as you spend more on your DSLR. Entry-level models have relatively small but clear viewfinders, mid-range DSLRs see an improvement, with viewfinders being larger and brighter. Full-frame DSLRs have the best viewfinders, providing a large, very sharp and clear image.

6) Dioptic correction: Spectacle wearers can use a dial or switch to sharpen the viewfinder image for use without wearing their glasses. Most cameras offer a range of around +2 to -1 dioptres.

7) Viewfinder hood: Provides a comfortable rest and prevents stray light entering the viewfinder. Most are detachable, allowing for viewfinder accessories to be fitted, such as a viewfinder extender for more comfortable viewing, and an angle-finder to aid low-level viewing.

8) Viewfinder screen: Most show the position of the focusing points while some show the central spot/partial metering zone. Most screens have LEDs on the AF points that light up red when activated. Exposure information is usually shown along the bottom in green, although some have it running along the right side.

Did you know? A small number of mid-range and semi-pro/pro models boast interchangeable viewfinder screens to suit specialist uses, such as macro or architectural photography. Some cameras allow you to superimpose gridlines on the screen via a custom function so

you don't have to buy an extra screen.

Viewfinder blind: It's important to cover the viewfinder when taking long exposures as stray light penetrating the viewfinder housing can reach the metering sensor, leading to poor exposures. Some top-end cameras have an integral blind, but for most consumer-level DSLRs, an eyepiece cover is provided with the camera, either as a standalone accessory or attached to the supplied camera strap.

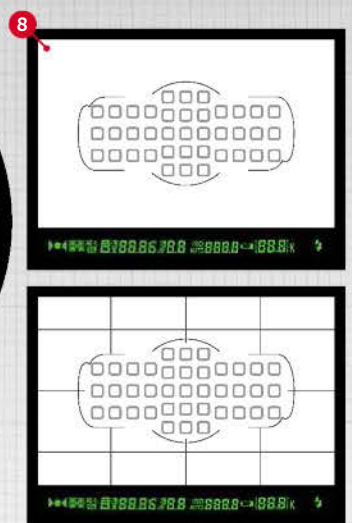
Eye sensor: This handy little feature saves battery power by deactivating the LCD monitor when it senses that the photographer's eye is looking through the viewfinder.

Frame coverage: While the semi-pro and professional models boast 100% coverage, most models only provide 95% to 98% coverage of the image frame. This means that, when composing the image, the final result will include slightly more of the scene at its edges than is evident through the viewfinder.

Magnification: The higher the magnification of the viewfinder,



the better, as it means a clearer, larger image that places less strain on the eye. Most cameras offer a similar performance in this respect to similarly priced rivals.



Above: Some cameras have a custom function to add gridlines.

Electronic viewfinders

CSCs, as well as Sony's translucent-mirror DSLTs (Alpha A58, A65, A77 and A99), use an electronic colour finder as opposed to the traditional optical type found in DSLRs. These have the advantage of providing 100% coverage and their live display is useful to judge exposure and White Balance. They also allow for plenty of exposure information to be displayed. However, they're not without their problems, particularly when used in low light, as they don't provide as clear an image as conventional viewfinders. The latest electronic finders are better than previous generations in this respect, but traditional viewfinders still hold the edge in terms of clarity and brightness.

Did you know? Some CSCs lack an integral viewfinder altogether, with users using the LCD monitor to compose the scene. This is usually to keep down the cost of the camera or to reduce its size.

REMOVE THE LENS and it's easy to tell a digital SLR from a CSC. The sensor on a DSLR is obscured by the reflex mirror (and also the shutter curtain behind it), while the mirrorless design of the CSC means the sensor is exposed.

1) Lens mount: The lens mount has electronic pins to transfer information used by the autofocus and exposure systems between the camera and lens. Different brands have different lens mounts, although Olympus PEN and Panasonic Lumix CSCs share the Micro Four-Thirds 'open' lens mount system.

2) DSLR (reflex mirror): Digital SLRs have a reflex mirror that reflects light upwards where a prism directs it towards the viewfinder. When you fire the shutter release button, the mirror raises out of the light path and a shutter curtain behind it opens to allow the exposure to reach the sensor. It's a tried and tested system, but adds to manufacturing costs and size of the camera compared to CSCs.

3) CSC (mirrorless): While digital SLRs and CSCs share many similarities, the biggest difference is that CSCs lack a reflex mirror. This allows them to be smaller and slimmer than a DSLR. The lack of a mirror means CSCs use an electronic finder and/or LCD monitor to compose images, with the image coming directly from the sensor, which is clearly visible when the lens is removed.



Image sensor

The sensor at the heart of the camera plays a fundamental role in digital photography. Getting to grips with its key characteristics will help you to achieve more with your digital camera. Let's start with sensor size...

■ SENSOR SIZE

Image sensors are produced in a number of sizes, with the full-frame sensor being the same size as a 35mm film frame. It's vital that you understand the importance of sensor sizes for a number of reasons, as follows:

- 1)** The size of the sensor determines the effective focal length of lenses used with the camera (see panel).
- 2)** In general, larger sensors can produce better-quality images because the pixels are larger, produce less noise and aren't so tightly cramped together.
- 3)** Larger sensors are more expensive to produce, so cameras are more expensive, too.
- 4)** A camera with a larger sensor also has a bigger, brighter viewfinder.

5) All else being equal, larger sensors give slightly shallower depth-of-field compared to smaller sensors.

Full-frame sensors are found in semi-pro and pro models, and have the same dimensions as a 35mm film frame. Their size allows for extremely high resolutions: Canon's EOS-5D Mk III has 22.3 million pixels, Sony's Alpha 99 has 24.3 megapixels, while the Nikon D810 has 36.3 million pixels.

The APS-H sensor was used in the EOS-1D series until the full-frame EOS-1D X arrived and aimed to give sports and wildlife photographers an extra boost due to the smaller sensor size.

APS-C is the most popular sensor size, found in the vast majority of DSLRs, as well as

DID YOU KNOW?

The two main sensor types are CMOS (Complementary Metal–Oxide–Semiconductor) and CCD (Charged Coupled Device). The former is the most commonly used.

many newer CSCs. The Four-Thirds sensor was the smallest of the four main types until the release of the Nikon 1 System and Pentax Q systems.
Full-frame: 36x24mm
APS-H: 28.7x19.1mm
APS-C: 23.6x15.5mm (Nikon, Pentax, Sony)
APS-C: 22.3x14.9mm (Canon)
Four-Thirds: 17.3x13mm
Nikon CX-format: 13.2x8.8mm
Pentax Q: 6.17x4.55mm

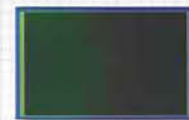
Full-frame



APS-H



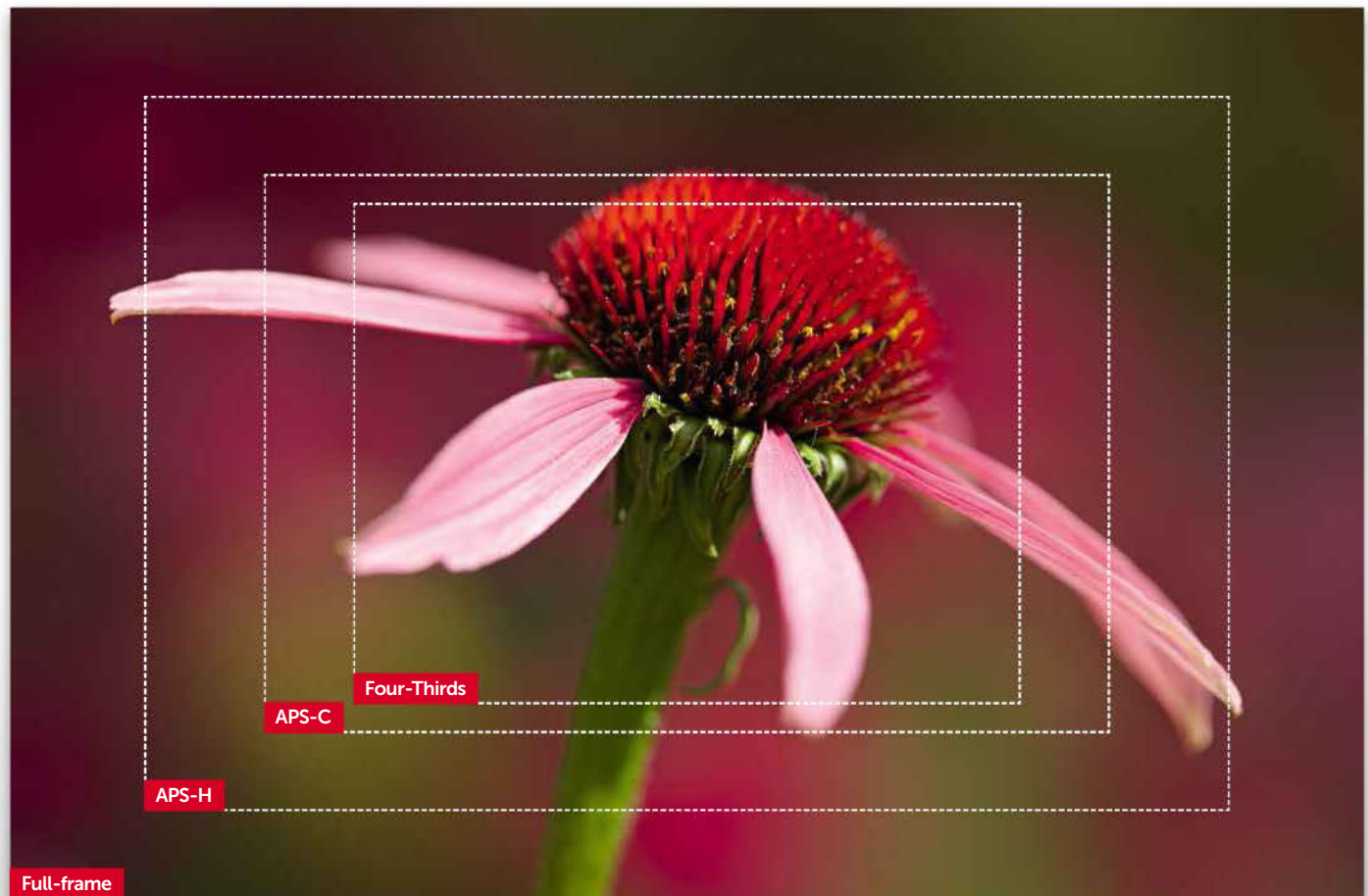
APS-C



Four-Thirds



Actual size



Did you know? A small number of image sensors do not follow the standard design. These include Fuji's X-Trans CMOS and Sigma's Foveon sensor

■ SENSITIVITY

Back in the analogue days, film sensitivity was stated as an ISO (International Standards Organisation) rating. This system is also used with imaging sensors. The lower the ISO rating, the less sensitive the sensor is to light. As the ISO rating increases, the signal output of the sensor is increased to boost its sensitivity, but this has the effect of increasing noise, too, which is undesirable. Sensitivity range varies depending on the sensor, but most offer ISO 100–6400. Top-end models offer a low ISO 50 rating, while some cameras have a top ISO of 102400, which is sensitive enough to capture images at night. Most cameras offer some form of noise reduction as an option.

■ IMAGE RESOLUTION

An image sensor is made up of millions of light-receptive photosites, best known as pixels. The more pixels a sensor has, the higher its resolution. The general term for a million pixels is 'megapixels', hence a sensor with 12 million pixels is commonly referred to as having

a 12-megapixel resolution. While it's easy to assume that sensors with a higher resolution deliver better image quality than those with fewer pixels, that is not always the case. The size of the sensor plays a part: as mentioned earlier, the larger pixels on bigger sensors generally deliver superior quality. Also important is the image processor, which uses the raw information provided by the sensor to produce the images. It's important to remember that the optical quality of the lens used on the camera has a major influence on overall quality, too.

■ SENSORS & LENSES

The relationship between the image sensor and the lenses used with your camera can seem confusing at first, but you'll get used to it with a little experience. It all relates to how the coverage provided by a lens changes depending on the sensor size.

If you take two identical lenses and fit one to a camera with a full-frame sensor and the other to a camera with an APS-C sensor, you'll find that the latter provides a magnified version of the scene.

This is because the smaller sensor uses a smaller area of the 'circle of illumination', which refers to the light passing through the lens. In effect, the smaller sensor crops the image, using only a central portion, and is said to have increased the effective focal length of the lens. This is usually stated as an equivalent to the 35mm film format or full-frame sensor.

Each sensor has a crop factor, which must be multiplied with the focal length to give the effective focal length. For instance, APS-C sensors have a crop factor of 1.5x (1.6x with Canon), and Four-Thirds sensors have a crop factor of 2x. So, for example, a 50mm lens used on a Four-Thirds sensor is stated as providing the equivalent focal length as a 100mm lens. The image it produces has the same field-of-view as a 100mm lens used on a 35mm film/full-frame sensor. The importance of this increase in effective focal length is that lenses used with smaller sensors effectively have more pulling power than when used on larger sensors. So a 100–300mm used on a Nikon

DSLR with an APS-C sensor has an effective focal length of 150–450mm. That's great news if you shoot a distant subject as you can fill more of the frame with it. The downside is apparent when using wide-angles: its coverage is restricted as it no longer has such a wide field-of-view. The crop factor of the main sensor sizes are:

Full-frame: 1x
APS-H: 1.3x
APS-C: 1.5x (Nikon, Pentax, Sony)
APS-C: 1.6x (Canon)
Four-Thirds: 2x
Nikon CX-format: 2.7x
Pentax Q: 5.5x

■ DIGITAL-ONLY LENSES

The popularity of the APS-C sensor has led to various manufacturers making lenses suitable only for DSLRs with this size of sensor. These digital-only lenses are usually more compact than mainstream lenses and cannot be used on DSLRs with full-frame sensors as they will cause gross vignetting. These digital-only lenses are designated by the main brands as follows: Canon EF-S; Nikon DX, Sigma DC and Tamron Di II.

Understanding exposure modes

If taking better pictures is your goal, then you need to understand exposure modes. Don't worry, it's not as difficult as you might think...

THE BASIC JOB OF an exposure mode is to ensure that just the right amount of light reaches the image sensor to record a 'correctly' exposed image using a suitable aperture and shutter speed combination. All modes are designed to give the correct exposure, but where they differ is in how they influence the final result, the amount of control you have over the aperture and shutter speed selected, and how quick and easy they are to use. Modes can be divided into two main types: basic and creative.

The basic modes include the full-auto and scene modes: the fully automatic modes, aimed at beginners, that give you very basic control over how the picture is taken.

The creative modes, which we term the core four – program, aperture-priority, shutter-priority and manual – play a major role in how your camera captures the scene, so it's

essential you learn how each works and the influence they have on the final result. These provide you with creative control of your photography and because they are the four modes we would recommend you learn, we'll cover them in detail here. These modes work in very different ways: for instance, in program mode, the camera takes care of either the shutter speed and aperture, but gives you scope to adjust virtually every other setting.

Aperture- and shutter-priority modes are semi-automatic: you take care of either the aperture or shutter speed, with the camera taking care of the other.

Manual gives you control of both. With experience, you'll find your favourite – for most, that's aperture-priority, but there are times when you may count on other modes, too. Follow our advice and you'll be able to choose the appropriate mode every time.

Setting exposure modes

As the exposure mode is a primary function of the camera, it should be simple to set. Virtually all DSLRs have an exposure mode dial on the top-plate, which allows the mode to be set easily and quickly. Pro DSLRs normally negate the dial in favour of a mode button, used in conjunction with the input dial. Some CSCs have a mode dial similar to a DSLR, located on the top-plate or on the rear, or a touchscreen option. Many – in particular, those at the budget end – lack a dial and instead use the menu screen and four-way control.



–Scene modes (also known as subject-biased programs)

Scene modes represent (in principle, at least) the perfect way for beginners to take brilliant pictures of different types of subjects. It all seems so easy: a novice shooting their loved one needs only choose portrait mode and snap away; while a walker on Snowdonia sets landscape mode and, hey presto, a stunning scenic is recorded. The truth is a little less photo-utopia than this.

While the camera will take a sharp, well-exposed image, it won't be anywhere near as good as if you use a creative mode and select the camera settings yourself. Ultimately, scene modes give high-quality snaps that you could take with a decent compact – your DSLR or CSC can give you so much more, so

only use them if taking images of scenes where you're unsure what to do.

Every Scene mode is designed to bias the camera for the subject you're shooting, removing control of the camera's key features. We're not just talking about the shutter speed and aperture either – metering, AF, exposure overrides, drive mode, built-in flash and White Balance, as well as ISO, are all taken out of your hands. From a beginner's point of view, that's a lot of potential problems taken care of by the camera, but from a creative photographer's point of view, that's a major loss of control. Our reference table shows the most popular scene modes and the key functions the camera takes care of or allows you to control. It's applicable

to most, but not all cameras, so check your instructions for a more detailed guide. As you'll see, you've much less influence on the result as using program or a creative mode, which is why the camera will never replace the photographer – it simply does not know what type of image you're trying to capture. The other key weakness of scene modes is that they'll always play it safe with exposure settings – in particular, using a shutter speed to avoid shake (the camera generally presumes you're shooting handheld). It will rarely go to extremes either, so if you're shooting a portrait in bright light and want very shallow depth-of-field, you're unlikely to find the aperture wide open, but rather at a more safe setting of f/5.6.

	Functions	Full-auto	Portrait	Landscapes	Close-up	Action	Program
Settings	Aperture & shutter speed	●	●	●	●	●	○*
	ISO rating	●	●	●	●	●	○
	White Balance	●	●	●	●	●	○
Focusing	One-Shot AF	-	●	●	●	-	○
	Continuous AF	-	-	-	-	●	○
	AI-Focus	●	-	-	-	-	○
	AF point selection	●	●	●	●	●	○
Exposure	Multi-zone	●	●	●	●	●	○
	Spot/Partial	-	-	-	-	-	○
	Centre-weighted	-	-	-	-	-	○
	Exposure compensation	-	-	-	-	-	○
	AEB & AE-Lock	-	-	-	-	-	○
Drive	Single frame	○	○	○	○	-	○
	Continuous	-	-	-	-	-	○
	Self-timer	○	○	○	○	○	○
Built-in flash	Auto-flash	●	●	-	●	-	○
	Forced-on	-	-	-	-	-	○
	Flash-off	-	-	●	-	●	○

Table key: ● Set automatically ○ User-selectable - Not available * Program Shift



– Program mode (P)

Set your camera to 'P' and it becomes a fully automated machine. Point it towards a subject or scene you want to photograph and not only will it measure light levels to determine the correct exposure, but it will then go ahead and set both the aperture and shutter speed for you to achieve that exposure.

Whether or not you see this as an advantage or a hindrance depends how much experience you have behind a camera. Beginners like program mode because it's quick and easy – all you do is point, focus and shoot, with the minimum of things to think about, and therefore less chance (or so it seems) of making a mistake. Experienced hands are less enthusiastic about program mode for the very same reason: they feel it's too automated and prefer to take control of the camera, rather than feeling that the camera has taken control of them. This is achieved by opting for a semi-automatic or manual mode.

For snapshots at parties or when you're on holiday and so on, program mode is ideal as it will deliver good photographs time after time. It can also work well if you're wandering around, shooting a variety of different subjects, or if you need to act fast when taking photographs at, say, carnivals and festivals,

and are more interested in getting decent shots rather than trying to create works of art.

The main drawback with program mode is that the combination of aperture and shutter speed seems almost to be chosen at random by the camera, so you may find when you point it at your subject in readiness to take a shot that it sets a wide aperture and fast shutter speed when you really need a smaller aperture to increase depth-of-field or a slower shutter speed to blur movement. The camera doesn't know this because it can't read your mind (technicians are working on that one!), but it does go some way towards this by offering program shift (see panel on the right).

You can also increase or reduce the exposure to correct errors for creative effect by using the camera's exposure compensation facility. This makes program mode much more versatile and, in experienced hands, it can work well as a quick and easy all-rounder. Nevertheless, it still tends to be the choice of beginners who don't yet understand things like depth-of-field and just want to take sharp, well-exposed photographs. And once they do have a better understanding, they then tend to progress on to less automated exposure modes that offer increased control.

Program shift

Program shift lets you change the combination of aperture and shutter speed by rotating the input dial until you get your preferred choice. Use it to quickly change the aperture to a wider or smaller one, letting the camera change the shutter speed to maintain correct exposure, or select a faster or slower shutter speed, and watch the aperture change automatically. If you're shooting landscapes, for example, where you want more depth-of-field, you just need to 'shift' towards a smaller aperture, whereas if you're shooting action, 'shift' towards a faster shutter speed.



Shooting situations best suited to program mode



1) INDOOR 'INFORMAL' SHOTS

If you're taking informal pictures of family and friends, select 'P', pop up the flash if needed and fire away. You could also use full-auto, but this usually results in the flash being used, which often gives a less pleasing result.



2) FILL-IN FLASH EXPOSURES

Program is a good choice when you want to add a touch of fill-in flash to outdoor portraits. Just pop up the flash (or switch on a hotshoe-mounted flashgun) and let the camera take care of the exposure for you.



3) 'FUSS-FREE' GENERAL PHOTOGRAPHY

When you simply want to quickly grab a scene and haven't time to change settings, select program, fire off a couple of shots, then if you have time, use program shift to alter settings a little more to your liking. Perfect for candids.



– Full-auto & program

As well as the standard program mode (P), most cameras offer another fully automatic mode, commonly known as the 'green square', 'green auto' mode or 'full-auto' mode. At first sight, this may seem identical to the program mode, but they have their differences. Your camera's instruction book can give more details, but the key difference is that with program mode, only the aperture and shutter speed are set automatically by the camera: all the other functions, such as AF or metering patterns, can be set by you. This also includes the flash. In program, the camera indicates when flash is required (by flashing the lightning symbol), but requires you to pop up the integral flash before it will fire. With full-auto mode, the camera will automatically fire the flash if required. This is because the full-auto mode assumes the user has minimal photo knowledge: in other words, that they are an absolute beginner. Many cameras now boast an intelligent auto (iAuto or A+) mode, which acts much like the full-auto mode, but allows the user more control.



■ Program mode and flash

When light levels fall, the lightning symbol flashes as a visual indication for you to pop up the flash. If you don't, the camera will still take the picture, but if you're handholding, you risk shake. If you pop up the flash, the camera sets the shutter speed to the flash sync speed and usually leaves the aperture wide open to extend the flash range. The camera is only concerned with correctly exposing the subject, so the background will normally appear very dark – if you want to reveal detail in the backdrop, you need to use another mode.

■ Flashing shutter speeds

Your camera will do its best to give a winning combination of shutter speed and aperture, but in extremely bright or dark shooting situations (ie very rare situations), this may prove impossible. In very bright conditions, if the maximum shutter speed and smallest aperture are flashing, it indicates a risk of overexposure, so lower the ISO rating and, if the problem persists, use an ND filter. In dark situations, if the slowest shutter speed and maximum aperture blink, it means you risk underexposure, so raise the ISO rating.



– Aperture-priority mode (A or Av)

As the name implies, if you set your camera to this exposure mode, priority is given to the aperture selected. In fact, you decide which aperture (f/number) to set, and once you've done that (by using the input dial or appropriate buttons), the camera instantly chooses and sets a shutter speed to achieve correct exposure, based on the light reading taken by the metering system. The aperture and shutter speed set will be displayed in the camera's viewfinder, top-plate LCD and/or rear LCD monitor so you're fully aware of both, even though you've only chosen the aperture.

Aperture-priority is an ideal exposure mode to use when you need to control depth-of-field (how much of the scene appears sharply focused). If you're shooting landscapes and architecture where front-to-back sharpness

is required, all you do is select a small aperture, such as f/11 or f/16 or f/22. At the other extreme, if you need to minimise depth-of-field so only a shallow zone of sharp focus is achieved – when shooting portraits, for example – you can set a wide aperture (small number), such as f/4 or f/2.8.

Because the camera instantly responds to any change of aperture by adjusting the shutter speed so correct exposure is maintained, you can work quickly – shooting at a small aperture (and slower shutter speed) one minute, then switching to a wider aperture (and faster shutter speed) the next. This also makes aperture-priority the best exposure mode for general shooting situations, and it's perhaps the most widely used mode among serious and experienced photographers.

Shooting situations best suited to aperture-priority



1) LANDSCAPES: MAXIMISE DEPTH-OF-FIELD

By changing the aperture, you're in full control of depth-of-field and how much of the scene appears sharp. Most landscape photographers use aperture-priority for this reason.



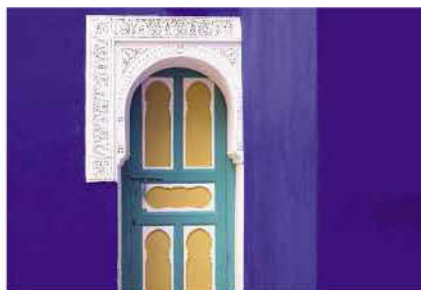
2) PORTRAITS: BACKGROUND OUT OF FOCUS

Most portraits work best when the subject stands out from the background, grabbing the viewer's gaze. Nothing does this better than focusing on the eye and using a wide aperture.



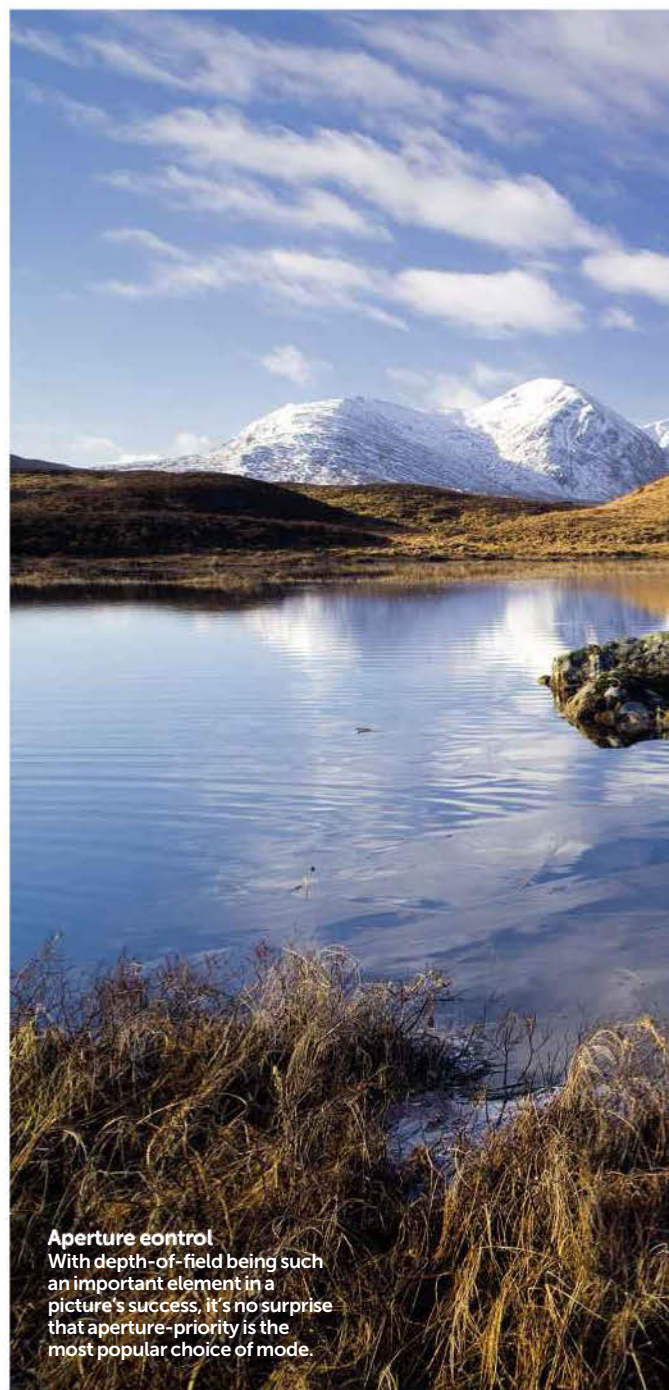
3) MACRO PHOTOGRAPHY

When you're working at very close distances, depth-of-field is minimal, so critical focusing, along with being able to use the optimum aperture, is essential for sharp results.



4) OPTIMAL SHARPNESS FROM YOUR LENS

Every lens has an aperture that gives the sharpest results – usually between f/8 and f/13. So if ultimate sharpness is your aim, set aperture-priority and shoot at these settings.



Aperture control

With depth-of-field being such an important element in a picture's success, it's no surprise that aperture-priority is the most popular choice of mode.

Aperture-priority & slow shutter speeds

The main thing to be aware of when shooting with aperture-priority is that as you choose a smaller aperture, the corresponding shutter speed set by the camera will become slower and slower, so the risk of camera shake increases. It's easy to forget this when you're busy shooting, especially in low light, or if you decide to use a polarising filter, which loses two stops of light, as you're giving priority to the aperture and depth-of-field. But it's also important to keep an eye on the shutter speed being set by the

camera so you don't end up with blurred images! Once the shutter speed drops below a level that you can safely handhold, you've three options. These are as follows:

1) Set a wider aperture so the shutter speed increases. For example, if the shutter speed at f/11 is 1/15sec, at f/8 it will be 1/30sec, at f/5.6 it will be 1/60sec and at f/4 it will be 1/125sec. This option won't work if you need a small aperture to give lots of depth-of-field, but photographers often stop their lens down too far, so you may be able to use a wider

aperture without compromising depth-of-field.

2) If you can't sacrifice depth-of-field by using a wider aperture to increase the shutter speed, mount your camera on a tripod or some other support so that it's not going to move. Steadying your camera means it doesn't matter if the shutter speed is slow. This is best when you're taking pictures of static subjects, such as landscapes, architecture and still-life.

3) The final option is to increase the ISO setting so a faster shutter speed can be used. For example,

if shooting at ISO 100 at 1/30sec at f/16, increasing the ISO to 200 will allow you to use a shutter speed of 1/60sec at f/11, raise it to 400 and the shutter speed will be 1/125sec at f/11, and so on.

If you're on the ball, you can combine the above options. Increasing a stop lets you maintain your chosen aperture and use a faster shutter speed without much compromise on image quality. If that doesn't do the trick, you can also open up the aperture a stop without losing too much depth-of-field.

**DEPTH-OF-FIELD**

This mode is usually used when you want to control depth-of-field. Remember, the wider the aperture (eg f/2.8), the more shallow the depth-of-field and vice versa

APERTURE-PRIORITY AND FLASH

How aperture-priority works with flash varies on the brand and model of camera you have. For instance, with most Canon and Pentax models, once you select the aperture, the camera chooses a shutter speed to correctly expose the background, so in low light, the camera needs to be tripod-mounted to avoid shake. In effect, the camera is automatically applying slow-sync flash. With Nikon, Sony and Olympus, the shutter speed is limited to prevent shake, unless the slow-sync flash mode is selected. Check the instruction manual to see how aperture-priority works with flash and experiment with results.



ISTOCKPHOTO

WARNING! FLASHING SHUTTER SPEED

When selecting the aperture, you may get to a point where the shutter speed starts flashing. This indicates that the camera is unable to provide a corresponding shutter speed, which will lead to poor exposures. This could be because you're shooting in very bright light and have selected too fast an aperture or, alternatively, have set too small an aperture in low light. With the former situation, lower the ISO rating and consider using an ND filter. With the latter, raise the ISO rating. If this doesn't solve the problem, you'll need to change the aperture setting until the shutter speed stops flashing.

**EXPOSURE COMPENSATION AND APERTURE-PRIORITY**

If you apply exposure compensation in aperture-priority mode, the shutter speed is adjusted to change the exposure and the aperture stays the same, as you are giving it priority. For example, if you're shooting at 1/250sec at f/4 and you dial in +1EV (one stop) of exposure compensation, the camera will change the shutter speed to 1/125sec, but leave the aperture unchanged at f/4.



–Shutter-priority mode (S or Tv)

This is the second semi-automatic exposure mode that you'll find on all DSLRs and CSCs, and, as the name suggests, it gives priority to the shutter speed. Shutter-priority allows you to choose the one you want to use while the camera sets the aperture automatically to achieve correct exposure – in other words, it's the opposite to aperture-priority.

Shutter-priority is the ideal exposure mode to use when you're shooting subjects that require careful choice of shutter speed to control motion. Sport and action are top of the list as you generally want to freeze movement by choosing a shutter speed that matches the subject: the faster the movement, the faster the shutter speed needed to freeze it, and vice versa. Common sense, really. Nature photographers often use shutter-priority, too, when photographing birds in flight, say, or animals on the move. While everyday action subjects, such as your kids running around in the park or the family dog shaking its wet coat after a dip in the sea, may also benefit from the use of shutter-priority mode.

Of course, shutter-priority isn't reserved only for freezing movement: sometimes you will also want to intentionally blur it to capture a sense of grace and motion in your images. Sport and action subjects can be photographed using a slow shutter speed by panning the camera, so the subject comes out relatively sharp while the background is blurred. Or you may simply decide to keep the camera still and let moving subjects record as colourful streaks. Moving water in rivers, waterfalls and the sea is also often

photographed using a slow shutter speed, so it records as a milky blur. In each case, there is usually an optimum shutter speed to help you achieve the best result, and shutter-priority mode will allow you to set it.

You may be one step ahead of us here and thinking, 'But surely I can set the shutter speed I want in aperture-priority mode just by changing the aperture until the camera sets the shutter speed I want, or in program mode by changing the aperture and shutter speed combination?' If so, you're correct. However, the benefit of using shutter-priority mode when you need to shoot at a certain shutter speed is that, once it's set, it won't change if the light levels fluctuate or you change camera position. If the exposure needs to be adjusted in shutter-priority mode, it's the aperture that changes, so that the shutter speed remains constant (the opposite happens in aperture-priority). The same applies if you use your camera's exposure compensation to increase or reduce the exposure – in shutter-priority mode, the aperture is increased or reduced and the shutter speed remains unchanged.

If prevailing light levels are too low to allow you to use a fast enough shutter speed, even with the lens at its widest aperture, all is not lost – simply increase the ISO. For example, if the fastest shutter speed you can manage at ISO 100 is 1/125sec, at ISO 200 it will increase to 1/250sec, at ISO 400 it will be 1/500sec, and so on, giving you additional control so you can set the shutter speed you need.

At the other extreme, if you need to set a slow

shutter speed to blur movement, when light levels are high you may find that the slowest you can manage isn't slow enough. Again, reducing the ISO may do the trick. Some cameras have a 'Low' ISO setting that's half the speed of the default ISO, so if you select it, the slowest shutter speed you can use will halve – from 1/15sec to 1/8sec, for example. If that doesn't work, you'll need to resort to using filters. A polariser loses two stops of light, so if you pop one on your lens, 1/4sec becomes one second.

Alternatively, use a Neutral Density (ND) filter to increase the exposure – a 0.6ND will have the same effect as a polariser, a 0.9ND requires a three-stop exposure increase and a 1.2ND requires a four-stop exposure increase. For general shooting, you won't need filters for slower shutter speeds, but once you start experimenting with the creative use of blur, they are useful and allow you to make full use of your camera's shutter speed range.

Avoid camera shake

There is an easy method to determine when you risk your images suffering from camera shake. Ensure the shutter speed you use is the reciprocal of the focal length. So if you use a 55–200mm, set a shutter speed of at least 1/200sec; with a 70–300mm, use at least 1/300sec; and so on. Obviously lenses boasting an image stabiliser allow you to get away with slightly slower speeds than the reciprocal rule suggests, but it remains a good guideline to follow.

Shooting situations best suited to shutter-priority



RICHARD BELHAM

1) SPORTS & WILDLIFE: FREEZING ACTION

When shooting fast-moving subjects with the aim to freeze their movement, you need to set a fast shutter speed. Using shutter-priority lets you set the exact speed you want to use.



LEE FROST

2) MOVING SUBJECT: EMPHASISE MOTION

If you want to get a little more creative with your images of moving subjects, try using a slower shutter speed to blur their movements. It's also the ideal mode for panning.



HELEN DIXON

3) ZOOM BURSTS

This creative technique involves zooming the lens during a relatively slow exposure. Using shutter-priority lets you determine which shutter speed is best for the zoom you're using.



LEE FROST

4) LANDSCAPES: BLURRING WATER

The shutter speed has a dramatic effect on how water is recorded. Using shutter-priority, select a fast shutter speed to freeze its motion, or a very slow speed to turn it into a milky blur.



■ WARNING! FLASHING APERTURE

When choosing a shutter speed, the aperture value may blink, indicating that the camera is unable to provide a corresponding aperture, which may lead to poor exposures. This could be because you have selected too fast or too slow a shutter speed for the lighting conditions. If this is the case, change the ISO rating until the aperture no longer blinks, or if shooting in very bright conditions, use an ND filter.

■ EXPOSURE COMPENSATION AND SHUTTER-PRIORITY

If you apply exposure compensation in shutter-priority mode, the aperture is changed and the shutter speed stays the same. So if you have an exposure of 1/250sec at f/5.6 and apply +1EV, it will change to 1/250sec at f/4.

■ SHUTTER-PRIORITY WITH FLASH

Virtually all cameras handle flash exposures in shutter-priority the same way. You choose the shutter speed you want to use and the camera selects an aperture that will allow the scene to be correctly exposed by the ambient light, with the flash output exposing the subject correctly.



MIGUEL LISA

Mastering motion
Use shutter-priority when you want control over how moving subjects appear in the frame.



–Manual (M)

Manual exposure mode is called manual because you have to do all the work. Whereas with other modes the camera sets the aperture and shutter speed for you – or one or the other – in manual, you set both. An indicator in the viewfinder, top-plate LCD and/or rear screen tells you when the combination you've chosen has achieved correct exposure, or how far over or under the 'correct' exposure you are. Because of this, it's the slowest exposure mode to use and, consequently, the least used.

Some photographers swear by manual mode because they foolishly believe that the camera's metering system is more accurate in that mode than any other. However, there is absolutely no truth in this. The only way you can change how your camera measures light is by selecting a different metering pattern. But if you leave the metering pattern alone (most of us prefer to use whichever multi-zone pattern our camera offers, such as Evaluative with Canon and Matrix with Nikon), it will measure light in exactly the same way, no matter which exposure mode you use. Anyone favouring manual exposure mode over, say, aperture-priority for this reason is therefore making life more difficult for the sake of it, with no gain.

So, is there a use for manual exposure mode in this modern, automated digital age? Absolutely. If you're shooting with studioflash, for example, you need to set manual mode so that you can set the aperture needed to give the correct flash exposure, along with the camera's flash sync speed. If you use studioflash with aperture-priority mode, you can still select the aperture, but the camera will automatically set a shutter speed to correctly expose the ambient

light levels, not the flash.

If you do a lot of low-light photography and regularly need to use the Bulb (B) setting so the shutter can be left open to record traffic trails, fireworks, star trails etc, you may also need to set the camera to manual exposure mode to access the Bulb setting. Some DSLRs have Bulb as a self-contained setting, but on many, it's simply at the end of the shutter speed range in manual exposure mode.

Another benefit of manual exposure mode is that once you've set the exposure on the camera, it won't change, even if you move the camera or light levels go up or down. If you're shooting in tricky or changeable light, but need to maintain a fixed exposure, it's easier to do that in manual mode than using exposure compensation, or the exposure lock in conjunction with a different exposure mode.

Of course, this can be a curse as much as a blessing because if light levels change and you need to change the exposure, but forget to when shooting in manual mode, you'll end up with a badly exposed image. This doesn't happen with the other exposure modes because either the aperture, shutter speed or both are set by the camera, so if light levels change, the exposure will also change automatically to maintain correct exposure.

There are some photographers who prefer manual mode to other exposure modes, simply because they feel more in control of the camera, and that's perfectly fine. If you've only started shooting seriously in recent years, you may find this idea rather daft, but for photographers who spent years or decades shooting with manual-only cameras, old habits die hard and it just feels

Setting in Manual

This varies from camera to camera, but the majority of models use the following method: with the camera in manual mode, use the input dial to change the shutter speed. To change the aperture, press and hold the exposure compensation button and use the input dial to select the aperture. With some CSCs, the process is a little more fiddly, requiring you to use the four-way control and ring surrounding it to access the aperture and shutter speed.



more familiar. In experienced hands, manual mode can also be quick and reliable because it keeps you more in touch with both the aperture and shutter speed, and if the exposure needs to be overridden to correct error, you can do it by changing one, the other or both, instead of having to rely on using the camera's exposure compensation facility.

It's a case of one man's meat being another man's poison. Manual is slower and slightly more fiddly than other modes, but some of us just prefer it that way!

Shooting situations best suited to manual mode



1) STUDIOFLASH PHOTOGRAPHY

You need to use manual mode when using studioflash. The shutter speed must be set at the flash sync speed (or lower), while the exposure is determined by the aperture.



2) NIGHT PHOTOGRAPHY

While you could use either of the semi-auto modes for night shots, manual mode is the fastest way to make changes to the exposure, making it best for speed and convenience.



3) BULB EXPOSURES

The vast majority of cameras need to be set to manual mode to allow for the selection of the Bulb setting. This allows for creative long exposures that can last for up to an hour.



4) EXPOSURE BRACKETING

Those new to bracketing often use aperture-priority with exposure compensation, but a faster way is to make adjustments to the aperture and shutter speed in manual.



■ Using the exposure scale

Achieving the correct exposure in manual mode is easier than you may think. When changing the aperture and camera settings, all you need to do is use the exposure scale as a guide to whether your current settings will lead to over- or underexposure. Change the aperture and/or shutter speed until the exposure level mark sits on the '0', which indicates correct exposure. There is no exposure compensation facility in manual mode, but you can effectively over- or underexpose the scene deliberately by moving the level mark from '0' to a positive or negative value.

■ Manual mode with flash

Many people believe that because the camera is in manual, the flash functions in manual mode, too. In fact, that's not the case. In manual mode, you select an aperture and shutter speed to illuminate the background, with the flash concentrating only on correctly exposing the subject. Even though the camera is in manual mode, the flash still uses TTL (Through The Lens) metering to give an accurate flash exposure. With more sophisticated flashguns, a distance scale appears on the rear LCD monitor so that you're given an indication of the distance the flash can cover.



Ready for change
Experienced photographers use manual when shooting in difficult lighting conditions as it's the fastest way to compensate for factors like backlighting.

Autofocus: Understanding the fundamentals of how AF works

Your camera offers a variety of autofocus options to help ensure you capture sharp results and it's important that you know how they work

THE TECHNOLOGY built into even entry-level DSLRs these days is phenomenal when you think about it; all that computer wizardry processing information in milliseconds to give us high-quality images at the touch of a button. The trouble is, because today's digital cameras are so good, we tend to rely on them too much, expecting perfect photographs every time, and when we don't get what we want, we blame the camera!

This is especially true when it comes to focusing. Wind the clock back 25 years and focusing was a manual affair. Some of you may remember those halcyon days spent twiddling thumb and forefinger while trying to get two images to merge at the centre of the focusing screen so that sharp focus was achieved, but for most, your only experience of focusing will be pointing the camera at your chosen subject, pressing the shutter release and assuming a sharply focused image will result.

More often than not it does, especially when shooting static subjects that dominate the composition. But in some situations you will need to take control – either by choosing settings to suit certain subjects and conditions, or by taking over completely and focusing manually. We'll be taking a look at those scenarios shortly, but first a quick

rundown on how autofocus actually works, so you hopefully have a better understanding of why the camera doesn't always do what you want it to do!

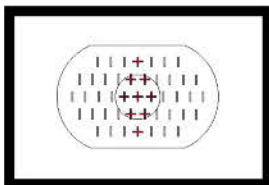
Basically, when light passes into your camera through the lens, most of it is bounced up off the reflex mirror into the viewfinder so you can see an image, but some is also reflected down onto a sub-mirror, which then bounces that light onto the AF sensor. On top of the AF sensor is a set of optics that splits the light into two beams. The sensor analyses these beams to determine how far out of focus the image is and whether focus is in front of or behind the focal plane, then adjusts focus accordingly. This happens so quickly that your camera can continually adjust focus as you track a moving subject, making successful action photography easier than ever before.

The system, known as Phase-Detection, uses the AF sensors to determine where to focus. The number of sensors varies from model to model but, generally, the more expensive the camera, the more sensors there are – the Canon EOS 550D has nine, for example, while the Nikon D3s has 51. You can either activate them all, then leave the camera to decide which ones to use, or select a specific sensor or sensors so you have more control over what the lens focuses on. Phase-Detection AF isn't foolproof and even the best systems can struggle when used in low light or if you try to focus on a plain area.

If you use LiveView, the AF system switches from Phase-Detection to Contrast-Detection, as the system can only work when the reflex mirror in the camera is in the 'down' position for viewing. When you use LiveView, the mirror flips up so light entering the lens goes straight to the camera's sensor. Contrast-Detection works on the principle that the contrast in an image is at its highest when that image is sharply focused so the AF system adjusts focus stage by stage and analyses contrast, often going past the critical point so it knows where it is, then adjusting back and locking focus. Contrast-Detection can focus on any part of the image area, which is why compact cameras have features such as Face-Detection. In the past, it proved slower than Phase-Detection, so wasn't suitable for focus tracking on moving subjects, and struggled in low light. However, notable exceptions are the Sony Alpha's LiveView, which uses a unique system, and the latest generation of CSCs.

AF sensors

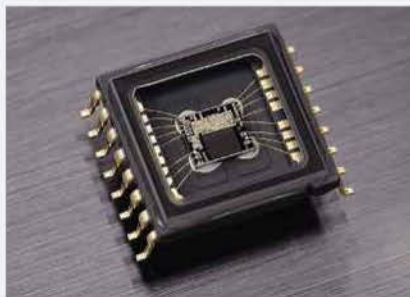
There are two types of AF sensor used in DSLRs – cross-type and line or linear. DSLRs have a mixture of both, with the cross-type being clustered more around the central



area of the viewfinder and linear sensors towards the edges. Cross-type sensors comprise two linear sensors crossing at 90°, hence the name. They're more accurate than linear sensors as they can detect both vertical and horizontal light patterns, whereas linear sensors can only work in one dimension. Therefore, cross-type sensors are more effective. That said, on high-end DSLRs that have lots of cross-type AF sensors, some of these sensors only work as cross-type when used with 'fast' lenses that have a maximum aperture of f/2.8 or wider, so if you're using zooms with a maximum aperture of f/4 or f/5.6, some of the cross-type sensors will only work like linear sensors.

Focus and metering

In more recent DSLRs – such as the Nikon D7100 – the AF is linked to the metering system to increase the chance of correct exposure. So, if you're using single point AF, the exposure set will be biased towards the brightness/tonality of whatever is behind the selected AF point, whereas if you're using a wide area AF where a number of AF points are active, the exposure will be influenced by whatever is behind the selected area (which gets bigger as the number of AF points increases). Nikon's Scene Recognition System broke new ground by linking the autofocus metering and White Balance systems, while more recently Canon has incorporated iFCL (Focus, Colour and Luminance), a system using autofocus colour and luminance information.



Critical focus

Learning more about your camera's AF modes will help ensure you focus on the correct area of the image.



KARL SHAW

A range of focusing options

DSLRs and Compact System Cameras now offer several ways in which you can focus on your subject. Here are the most common types.

■ **Phase-Detection AF:** This method is the system that has been traditionally used by film and digital SLRs and remains the primary method used for focusing in these cameras. Its main advantage is that it is incredibly quick and accurate, regardless of whether the subject is close by or at a distance. The system works by using a beam splitter within the camera that directs light on to a sensor – this measures what is known as the phase difference to calculate the subject distance. Phase-Detection struggles when there is a lack of contrast in the scene, such as in low light. Up until the last year or two, it was undeniably the fastest, most accurate form of autofocus in cameras, but the latest generation of Compact System Cameras offer contrast-AF systems that rival the performance of passive AF.



■ **Contrast-Detection AF:** The vast majority of Compact System Cameras, as well as the LiveView system used on many DSLRs, focus on subjects using contrast rather than distance to achieve accurate results. In the past, this system has proven to be slower and less accurate than the Phase-Detection method, but recent generations of DSLRs and CSCs have shown major improvements in performance. In fact, the latest CSCs boast Contrast-Detection systems as fast – if not quicker – than most DSLRs. While the Contrast-Detection AF used in most DSLRs' LiveView systems lags behind Phase-Detection AF, the Sony Alpha's LiveView is on a par with the best Contrast-Detection and Phase-Detection systems.



■ **Face-Detection AF:** This system first appeared on digital compacts but has since been included on many CSCs as well as a small number of DSLRs. It is designed to make it very easy for photographers to capture sharply focused portraits – in particular with two or more people in the frame. The camera does this by 'detecting' faces anywhere in the frame and focusing on them. This is a useful focus mode for beginners who are still getting used to multi-point AF.



■ **Smile-Detection AF:** This takes Face-Detection AF a step further, with the camera firing the shutter once it detects the subject is smiling. While this might seem like a bit of a gimmick, it's useful when you're shooting a self-portrait, as the camera won't fire until you smile. It's also handy when shooting groups. Shout out 'Smile!' and the camera as well as the subjects will respond to your request!



■ **Touchscreen focus:** A growing number of CSCs now boast touchscreen LCD monitors that allow you to change modes and functions by touching the relevant icons on the screen. This includes focusing – by using your finger to press the screen where your subject is positioned, you're able to instantly activate the AF system to lock focus on it.

■ **Trap focus:** A small number of cameras offer a feature that allows you to set the focus to a particular distance, then leave the camera to fire the shutter once the subject reaches this distance. It's particularly useful when photographing fast-moving subjects that are difficult to track using alternative focusing systems.

Autofocus: Your choice of modes

Your camera's AF system has two user-selectable functions: the AF mode and the AF point selection. Knowing how to use each for different situations will help ensure your subject is correctly focused

Autofocus modes: Allowing you to lock on the subject or continuously track it

Single-shot AF: In AF-S mode, the focus locks on the subject when you partially depress the shutter release and stays focused on the same distance for as long as the shutter is held down. A focus confirmation indicator in the viewfinder lights when the lens has locked focus, and an audible 'beep' can be heard. You then press the shutter button all the way down to take a shot. AF-S is ideal for static subjects – however, if either you or the subject moves once focus has locked, your subject may well end up out of focus as the focus will remain on the original point. To avoid that, you have to press the shutter release again to refocus on the subject in its new position. If the camera struggles to lock focus – say, because the area you're trying to focus on is closer than the minimum focus distance – the shutter won't fire. You can use AF-S with focus lock to focus on off-centre subjects. Select single-point AF (most people choose the central point), adjust the composition so the focus point falls over the area you want to focus on and partially depress the shutter button to lock focus. Providing you keep the shutter button held down, the focus won't shift, so you can recompose, then press the shutter button down fully to take the shot.



Perfect for...



■ **Portraits:** Use one AF sensor to focus on the subject's eye to capture the perfect portrait.



■ **Architecture:** Single-shot AF is ideal for static subjects, like buildings and bridges.

Continuous AF: Also known as Servo-AF, in this mode, the autofocus will continually adjust to keep your subject in sharp focus if it's moving or you're moving – or both! To use AF-C, make sure an active AF point is positioned over your subject, then partially depress the shutter button to lock focus. Providing you keep the shutter release partially depressed, and an active AF point over your subject, it should remain in sharp focus until you're ready to press the shutter button down fully to take a shot. If you have the camera set to continuous drive mode, you can also shoot rapid sequences of images by keeping the shutter button pressed down, and each frame should be in focus. That said, unlike AF-S, the shutter will fire in AF-C mode and take a shot even if the lens hasn't locked focus, or focus has strayed onto something other than your main subject, and when this happens you need to be careful that you don't end up with lots of out of focus images. Using Focus Assist points or Dynamic/Extended area AF will help, as it means that if the subject falls outside the main AF point you're using to track it, other AF points will keep it in sharp focus. This is handy for tricky subjects, such as birds in flight.



Perfect for...



■ **Sport:** Your first attempts at fast-moving subjects should be with AF-C mode.



■ **Animals:** Try continuous AF on animals to ensure you take sharp images.

Automatic AF: This is an 'intelligent' AF mode found in some DSLRs and CSCs where the camera automatically switches between AF-S and AF-C, depending on the subject. If the camera detects a stationary subject, it will set AF-S mode to get it in focus, whereas if it detects a moving subject, it will set AF-C to increase the chance of a pin-sharp image. It's handy to use if you're shooting a variety of different subjects in quick succession, some moving, some not, such as street or reportage photography. However, experienced photographers tend to stick with a specific AF mode so they know how the camera might react.



Perfect for...



■ **Candid:** If you're focusing on a subject without looking through the viewfinder.



■ **Children:** AF-A focus locks on a child, then tracks them should they start moving.

Manual focus: Although the latest AF systems are fast, accurate and reliable, there is still a case for using good old manual focus. If you've been a photographer for a long time, you may simply prefer it – old habits die hard and all that – but for some static subjects, being able to choose exactly where the lens focuses can be of benefit. With landscapes, for example, you usually want to record the whole scene in focus. To do that you need to be able to control how far into the scene the lens is focusing (ideally on the hyperfocal distance), and it's much easier to do that if you focus manually. Once you've focused the lens manually, you can also leave the camera in position while you wait for the light to improve, say, and be ready to shoot. It's also useful in low-light or low-contrast scenes where AF may struggle and macro is another area where manual focus can be handy. Depth-of-field can be so shallow that only the point you actually focus on will come out sharp, so it's preferable if you can choose that point and be able to adjust it as required, without relying on AF points and focus lock. Manual focus isn't so useful for moving subjects – AF-C is quicker and more reliable – but for static subjects, it's definitely worth trying.



Perfect for...



■ **Low light:** Your AF may have trouble locking on to a subject, so focus manually.



■ **Macro:** With very shallow depth-of-field, it ensures the correct area appears in focus.

Know your modes

While most cameras offer all these AF modes, each have a slightly different designation, as follows:

	AF-S	AF-C	AF-A
Canon	One Shot	AI Servo	AI Focus
Nikon	AF-S	AF-C	AF-A
Olympus	S-AF	C-AF	–
Pentax	AF-S	AF-C	AF-A
Sony	AF-S	AF-C	AF-A

Focus point selection: Use all AF points or focus on a single point for accuracy

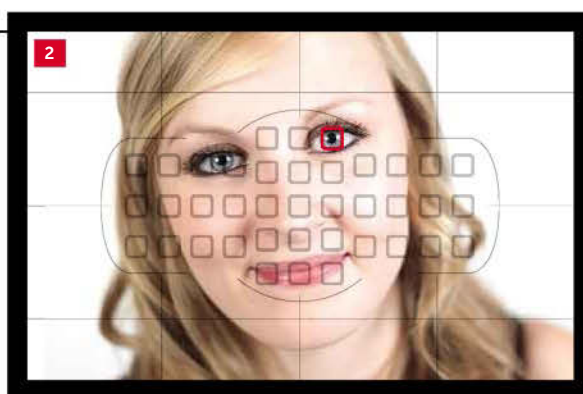
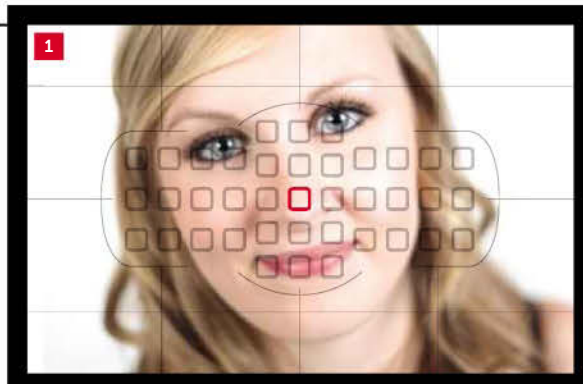


Single-point AF: Serious photographers tend to use single-point AF all the time as it allows you to choose exactly what the lens focuses on, rather than leaving it to the camera and risking it making a bad decision. There are two ways to do this. The first is to select the central AF point, as it's the most sensitive point your camera has. If the area you want to focus on is off-centre, all you do is place the central AF point over that area, half-press the shutter release to lock focus, recompose the shot and fire. This may sound fiddly, but if you do it all the time, it becomes second nature. The second method is to select a single off-centre AF point and use that. If you're taking lots of shots of an off-centre subject, especially if that subject is moving, this works better than using the central AF point as you don't need to recompose after locking focus. It's also preferable when shooting at really wide apertures and depth-of-field is shallow. Locking focus with the central AF point then recomposing may mean that the point you focused on is no longer in focus, whereas this won't



be the case if you select an AF point that allows you to compose the shot then focus on the desired spot, such as a person's eye, without moving the camera.

Using single-point AF: 1) With multi-point AF selected, the camera has focused on the nose and due to the very shallow depth-of-field, the face is out of focus. **2)** Select single-point AF and choose the sensor that falls over the subject's eye to ensure the subject is focused correctly. The final image now has the subject's eyes in sharp focus.



Multi-point AF: In multi-point AF mode, all the focus points, or a number selected by you, are active at the same time and when you partially press the shutter button, the points that are activated (in other words, are focusing on the subject) will flash red. Preference tends to be given to whatever is closest to the camera. If you're an absolute beginner, multi-point AF can be handy, as it gives you one less thing to think about. If you're taking general shots with your lens set to a smallish aperture (f/8, f/11, f/16), multi-point AF can also work fine because you want everything in focus and no one element in the scene needs to take centre-stage. However, because you have little control over what the lens focuses on, in situations where you do need to focus on something specific, such as a person's eye, it's best avoided as focus error is likely, especially when you're shooting at a wide aperture and depth-of-field is limited. The main exception on some cameras is where you can select a main focus point, then nominate others around it as focus 'assist' points so that if your subject strays beyond the main focus point, the others will still keep it in focus. If a moving subject is travelling across the frame, and remains at roughly the same distance from you,



multi-point AF can also work because as the subject moves to an area covered by another AF point, that sensor becomes active and keeps the subject in sharp focus.

Using multi-point AF: When in multi-point AF mode, and having partially depressed the shutter button, the focus points select areas closest to the camera. When focus is locked, the points turn red. If you want to select different focus points, release and re-press the shutter.

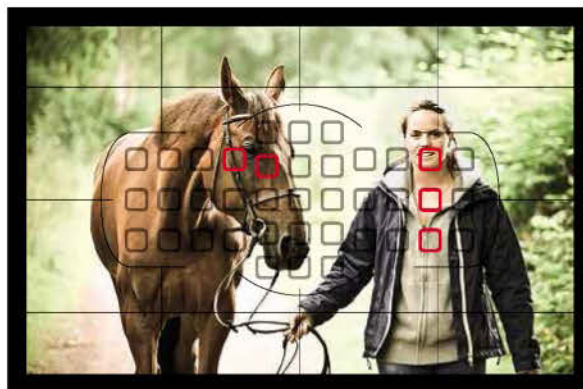


Image quality

Your camera offers a number of image settings, based around shooting in Raw or JPEG, which have a major effect on the quality of your images. We explain what they are and when you should use them

WHEN YOU TAKE a picture, your camera sends the information from the image sensor via the processor to the memory card. You have control, via the Image Quality settings, over how the image data from the sensor is processed before reaching the memory card. You can set it to record the highest image quality, to compress the image information at varying degrees or to shoot at a lower resolution to fit more on the card and speed up processing. The choice is yours and it's worth understanding the options available to ensure your images best suit your requirements.

■ MAIN FILE FORMATS: RAW & JPEG

There are two main file formats a digital camera can save your images as: Raw and JPEG. Raw format is, as its name suggests, an unprocessed file that contains all the original data captured by the image sensor. It's used when maximum image quality and flexibility is desired, but the resultant large file size means that speed and the number of files that can be stored on a memory card are reduced. Shooting in JPEG has a number of advantages, which is why many amateur photographers favour it. Images captured as a JPEG are processed more quickly than a Raw file and require less space on a memory card, so you can store considerably more images. As images are compressed to reduce the file size, there is some loss in quality, but for most uses, when minimum compression is used, this is negligible. And for those of you wondering, JPEG stands for Joint Photographic Experts Group.

Most cameras allow you to select Raw+JPEG, which provides you with a JPEG image for fast image review and selection, and the Raw files to edit for best quality.

■ JPEG: IMAGE COMPRESSION

As mentioned already, shooting in JPEG is a compromise between image quality and file size. JPEG is what's known as a 'lossy' format

Image quality and memory card capacity

The following table is a quick guide to the approximate number of full resolution images that fit on a 4GB and 8GB card at different image settings. As you can see, each brand compresses to different levels, so the figures aren't always as you'd expect them to be. Cameras used for this table were the Panasonic Lumix GF3, Samsung NX11, Nikon D7000 and Canon EOS 550D.

Camera Resolution Megapixels	RAW		RAW + JPEG (Max)		JPEG (Max quality)		JPEG (Min Quality)	
	4GB	8GB	4GB	8GB	4GB	8GB	4GB	8GB
12	280	540	180	370	600	1,180	1,200	2,350
14.6	140	280	102	200	550	1,120	1,700	3,350
16	116	225	82	160	280	550	1,100	2,100
18	150	300	118	230	555	1,080	1,100	2,150

in that some information is lost to be able to compress the image. The more the image is compressed, the higher the amount of information that is lost and hence the image quality will be worse. When selecting JPEG as your file format, you can set the level of compression and therefore determine the amount of data loss.

Most cameras provide a choice of three settings, allowing minimal, medium and maximum amounts of compression. If you choose the minimal compression, you'll reduce file size but limit the amount of information lost, and because the best-quality JPEGs look virtually indistinguishable in general use to Raw files, this is the most popular choice of setting with many photographers.

Once you compress image files further, you begin to lose increasing amounts of data that degrade the image, reducing the level of detail and introducing what is commonly termed artefacts: most notably blockiness and added noise, noticeable in areas of the image with even tones.

The problem of JPEG compression isn't as clear to see with images that are reproduced at a small size, but if you crop areas of an image or print A4 or larger, it's far



Raw to JPEG

One major advantage of shooting in Raw that's rarely mentioned is the benefits of converting to a JPEG in post-production. By converting a Raw file on your computer, the resulting image will normally retain slightly more detail than a JPEG processed in-camera. The difference is small, but for the very best JPEG, convert from Raw.

easier to spot compression-related problems. One final point to note is that you lose a little extra data every time you resave an image. So save the same JPEG file ten or 20 times and it will have lost a significant amount of information that may be apparent when viewed at high magnification. The images opposite show how much an image is affected by resaving numerous times.

RAW FORMATS

The following are the Raw file extensions for major brands
 Canon: .CR2/.CRW
 Nikon: .NEF
 Olympus: .ORF
 Panasonic: .RW2
 Pentax: .PEF/.DNG
 Samsung: .SRW/.DNG
 Sony: .ARW

Where to find Image Quality settings on your camera

This is a major function, so you should find it is one of your first options. Here's where to locate it on most popular brands of camera.



■ Canon

The Quality option is very easy to find: it's on the first line of the first tab.



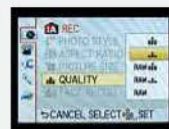
■ Nikon

Found on the Shooting Menu or accessed via a Quality button.



■ Olympus

Look for the  symbol, located on the Shooting Menu 1.



■ Panasonic

Press MENU and choose Rec or add Quality option to your Q MENU.



■ Pentax

Press the MENU button and Image Quality is on camera menu 1.



■ Samsung

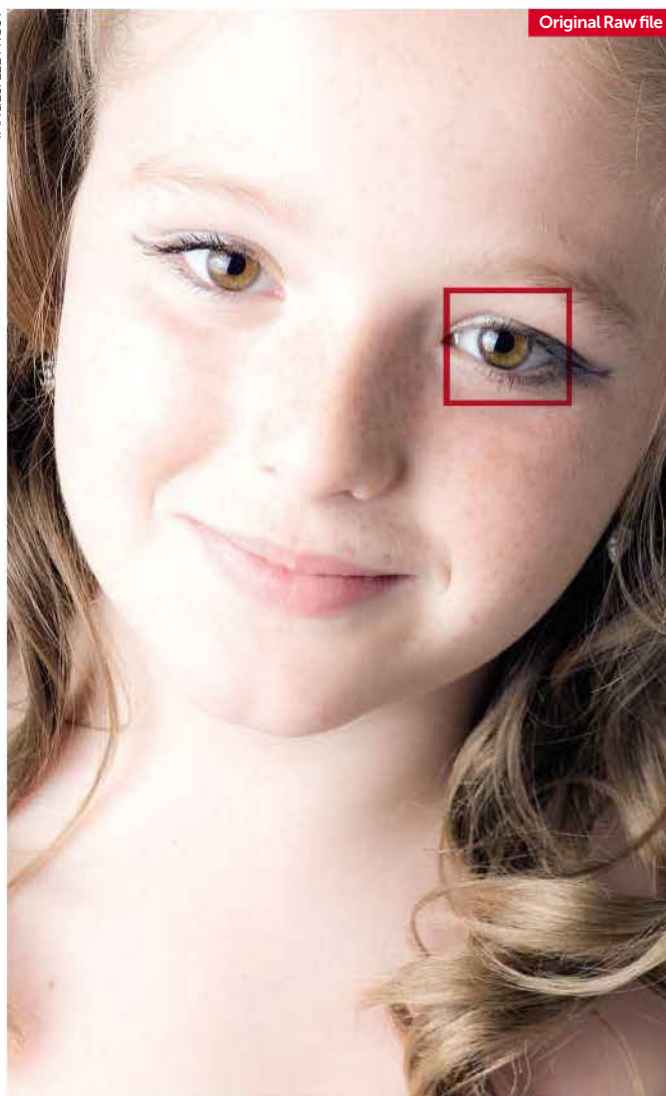
Press the MENU button and Image Quality is on Shooting Menu 1.



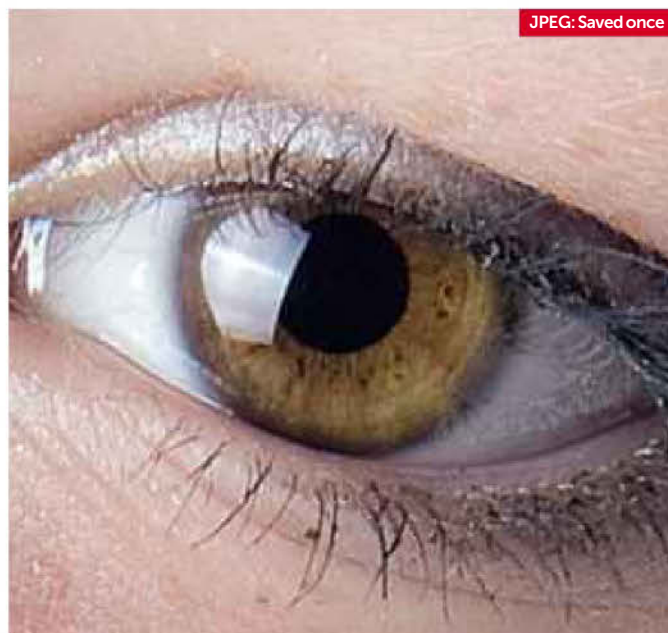
■ Sony

Press the MENU button and you'll find Quality on Shooting Menu 1.

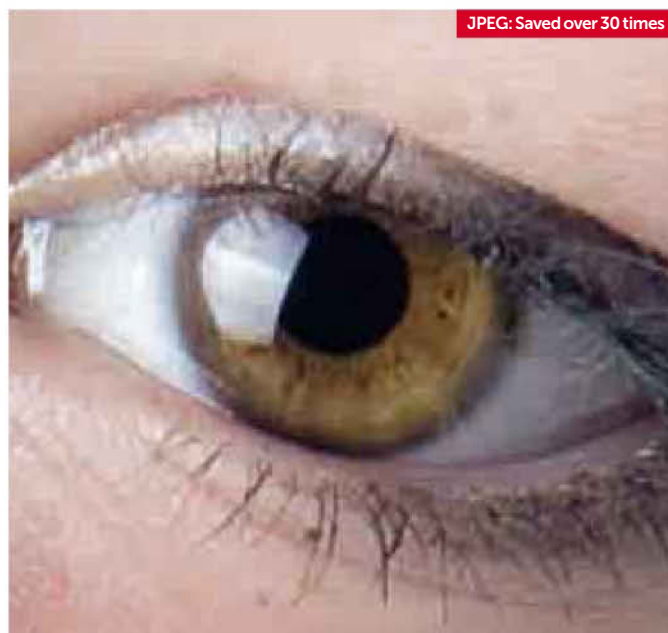
IMAGES: LEE FROST



Original Raw file



JPEG: Saved once



JPEG: Saved over 30 times

Above: JPEG quality comparison – JPEGs use a 'lossy' compression system, which means with every save, a little bit of image information is lost. Resave a file too many times and it will adversely affect image quality.

Image size

As well as taking pictures at maximum resolution, you can set your camera to shoot at lower resolutions, too. The most common use for this is when taking images for web use, when memory card capacity is at a premium or when shooting items to sell on eBay. You'll need to refer to your camera's instruction manual to see what each setting relates to in terms of resolution, but, in general, the middle setting shoots at slightly higher than mid-resolution, while the lowest setting is around two- to four-megapixels. Here's how the image sizes are stated on popular brands (note some older models may vary).

Brand	Maximum resolution	Medium resolution	Lowest resolution
Canon	L	M	S
Nikon	L	M	S
Olympus (older)	SHQ	HQ	SQ
Olympus (newer)	L	M	S
Panasonic	L	M	S
Pentax (K-x)	12M	10M or 6M	2M
Samsung (NX11)	14M	10M or 6M	2M
Sony	L	M	S

JPEG compression

JPEG compression is displayed differently, depending on your brand of camera, as follows. Remember: select minimum compression for the best quality and maximum compression when you need to maximise space on your card at the cost of image quality.

Brand	Least Compression	Medium Compression	Most Compression
Canon			–
Nikon	Fine	Normal	Basic
Olympus (older)	SHQ	HQ	SQ
Olympus (newer)	F	N	–
Panasonic	===	---	–
Pentax*	☆☆☆	☆☆	☆
Samsung	Super Fine	Fine	Normal
Sony	Fine	Standard	–

* Some newer Pentax models offer four levels of compression

ISO ratings

By changing the ISO rating, you're able to affect the sensor's sensitivity to light and your ability to capture great images in all lighting conditions

THE ISO (International Standards Organisation) rating was originally created to indicate the sensitivity of film emulsion, but has carried on through to the digital age, where it now provides a standard measure of an image sensor's sensitivity to light. The lower the ISO rating, the less sensitive the sensor is to light; the higher the ISO rating, the more sensitive it is.

The ISO rating, along with the aperture and shutter speed, plays an integral part in the exposure of an image. Low ISO ratings are sometimes described as 'slow', as using it usually results in a slow shutter speed being required; while high ISO ratings are occasionally termed 'fast' because they allow for fast shutter speeds to be used. However, the most common terms for ISO ratings are low (ISO 200 and below), medium (ISO 250-640), fast (ISO 800-1600) and very fast (ISO 3200 and above).

■ ISO 'SENSITIVITY' AND NOISE

The image sensor is receptive to light and has an electronic current, or signal, passing through it, which feeds the image information through to the processor before the data is transferred to the memory card. As you change the ISO rating on your camera, you're actually not increasing the sensor's sensitivity to light, but rather adjusting the strength of the signal passing through it.

Increasing the signal has the unwanted side effect of increasing signal noise which, as you can see in these images here, becomes more visible in images taken with fast ISO ratings. The higher the ISO, the stronger the signal and therefore the greater the amount of noise present in images.



Using ISO ratings

Most cameras cover an ISO range of 100–3200, a few go as low as ISO 50, while many go as high as ISO 6400. There are a few models with even higher ISO ratings, such as the Nikon D4, which has a maximum ISO of 204800! As with apertures and shutter speeds, ISOs are changed in full stops or fractions of a stop. All you need to do is press the ISO button and select the rating you wish to use, based on the shooting conditions and the effect you're trying to capture. As with the other two exposure variables, ISO can be used creatively, so

getting to understand how ISO works can really benefit your photography. Remember that your choice of ISO has an effect on how your scene is captured, especially if it includes any moving elements. A low ISO limits the choice of shutter speeds, so may result in moving subjects being blurred, whereas a fast ISO gives you more choice at the expense of noise.

As well as being able to set ISO manually, there is an Auto setting that lets the camera choose the ISO for you. This is particularly useful when shooting in

low light as it helps balance ambient light with flash, but we'd suggest you avoid the ISO Auto setting when shooting creatively. For instance, there is no point tripod-mounting your camera to shoot dusk and setting a high ISO of 1000 to avoid shake, as it will only add substantial noise.

Knowing what ISO rating is best to use comes with experience, in much the same way as learning which shutter speed or aperture is best. However, there are some guidelines as to when you should select a low, medium or high ISO rating, as follows...

ADAM BURTON



■ WHEN TO USE LOW ISO RATINGS (ISO 50–200)

For the best possible image quality, use a low ISO. Colours are at their most accurate, tones exhibit smooth gradation, noise is minimal, while sharpness and detail is at its highest. A low ISO means the sensor has low sensitivity to light and limits your choice of shutter speeds, so even at a wide aperture, take care to avoid camera shake by using a tripod or image stabilisation. Most enthusiast and pro landscape photographers shoot with a low ISO and their camera on a support. Studio-based photographers using flash heads use a low ISO, too, as the powerful studioflash heads provide enough light to shoot handheld. Avoid using a low ISO if you're shooting handheld, except in the brightest conditions. Even then, take care if using a mid- to-small aperture with a telezoom.



HELENDIXON

■ WHEN TO USE MEDIUM RATINGS (ISO 250–640)

We'd suggest you make ISO 400 your default setting. It gives a two-stop advantage over ISO 100, which provides far more flexibility in your choice of exposure settings. Despite this increase in speed, all but the most discernible eye will see any difference in quality compared to an ISO 100 image. Those regularly using the integral flash will note an increase in flash range: ideal when shooting portraits indoors. So, what are the drawbacks? Well, there aren't really any of significance. You could argue that colours aren't as natural, noise is higher and sharpness lower, but, in truth, the differences are hard to spot. So, for general use, leave your camera at ISO 400 unless shooting in low light and need a faster speed, or want to use a low ISO for the ultimate quality.

HELENDIXON



■ WHEN TO USE FAST RATINGS (ISO 800–1600)

Selecting a fast ISO rating should be the result of necessity. A higher ISO results in images having more noise and less sharpness, especially if using Noise Reduction. That said, the most recent cameras have seen a marked improvement in the quality of their high-ISO images. The most obvious time to use a high ISO is when taking handheld pictures in low light, such as outdoors in the evening or indoors. A high ISO allows you to select a fast enough shutter speed to avoid shake, with the use of an image stabiliser helping matters further. Many use a low ISO and risk images being blurred by camera movement, but we suggest using a fast ISO: it's better to have a sharp, noisy image taken at ISO 1000 than a blurry image taken at ISO 400.



ISTOCK PHOTO

■ WHEN TO USE VERY FAST RATINGS (ISO 3200+)

Digital cameras already perform better at fast ISOs than film managed, especially models like Nikon's D4, which produces unbelievable quality at high ISOs. Images taken at ISO 3200 are characterised by increased noise, less than accurate colours and reduced sharpness, with all these inherent problems getting worse as the ISO rating is increased. Some models, like the Canon EOS-1D X and Nikon D4, boast a top rating of ISO 204800 – fast enough to capture images by moonlight, making it ideal for surveillance, but for most forms of photography, this speed is excessive. Therefore, only use it if you really have to. If you're out at night and spot a yeti or a UFO hovering overhead, by all means select ISO 12800 or above and capture the evidence. Otherwise, use a lower ISO.

Working with Raw files

Shooting in Raw format produces superior image files and, ultimately, better photographs than JPEGs – but only if you know what to do with your Raw files once you've shot them! Here, we explain how to do just that

PHOTOGRAPHERS LIKE to have a topic to argue about. Film, lenses, camera models: pretty much everything associated with picture-taking has been the subject of one debate or another over the decades.

For the last few years, 'Raw v JPEG' has been the hot topic, with the vast majority of serious photographers insisting that Raw files are better by a mile, while a small, but vocal, minority burst blood vessels in support of JPEGs and accuse Raw fans of being lemming-like nerds who haven't got a clue. As one American JPEG devotee once said: "Shooting in Raw is like hoarding newspapers for 20 years – you know you might need the information sometime, but it sure gets in the way. And other people think you're crazy!"

Whether that's true or not depends on what you shoot, how you shoot it and how

much control you like to have over the final image. There are pros and cons to both formats, just as there were with negative film and slide film. Back in the days of film, photographers accepted that and used both. In this digital age, however, there seems to be a reluctance to follow suit – it's either Raw or JPEG and 'never the twain shall meet'.

It's often thought shooting in Raw is for experienced photographers and JPEGs are better suited to beginners – which is why newcomers tend to use JPEG over Raw. However, to a large extent the opposite applies, as this guide will hopefully show.

When you take a photo, data is recorded by the sensor. If you leave this data in its original form, you have a Raw file, which is a 12-14 bit uncompressed file containing all the lossless data from the sensor.

All digital cameras initially produce Raw files, but if you shoot in JPEG format, the camera's firmware (its internal software) processes the Raw file before saving it to the memory card. In doing so, it compresses the file by deleting data it doesn't think is necessary – data that can't be retrieved later – as well as adjusting colour, contrast and sharpening the image. A simple way to compare Raw files and JPEGs is by making an analogy with film. If you imagine that Raw files and JPEGs are the digital equivalent of negatives, shooting in Raw is like processing and printing your own film in that you have far more control and creative scope, but it takes longer to achieve the end result. JPEG, on the other hand, is like taking your film to a mini lab and picking up a wallet of prints an hour later – quick and convenient, but the prints have been made by a machine and aren't necessarily the best that can be achieved from those negatives.

Software for Raw



Perhaps the biggest drawback of using Raw is that, in order to work with Raw files, you need specialist software, often referred to as a Raw Converter, to open and edit Raw files before saving as a TIFF or JPEG.

Each camera brand has its own Raw format, so when you buy a camera, it's supplied with its own Raw Converter, but in truth, most photographers prefer to use a third-party converter. There are a number available, from freeware like Gimp, to the likes of Capture One and Apple Aperture (Mac only), which are both aimed at enthusiasts and pros. However, for the vast majority of us, it's Adobe Camera Raw (ACR) found in Lightroom and Photoshop that is used, and is the one covered in detail in this guide. It works brilliantly and, for most, produces results indistinguishable from specialist Raw packages. Please note: if you upgrade your camera, you may have to wait for Photoshop's updated Raw plug-in. Worse still, if you have an older version of Photoshop (eg CS2 or CS3) and buy a new camera model, no upgraded plug-ins for your old version of Photoshop are available, meaning you need to buy a Photoshop upgrade!



Key benefits of Raw

- Raw files contain more data than you need to create a successful image, so they can be processed and interpreted in any number of ways – think of them as digital negatives with high dynamic range.
- You can correct exposure error without compromising image quality.
- When you process a Raw file, you still have the original in its unmolested form.
- You can return to Raw files in the future when you're more experienced and skilled and reprocess them again, achieving better results.
- Image quality is superior – Raw files are 12-14 bit uncompressed.
- A computer has far more processing power than a camera.

Three reasons why you should use Raw



1) White Balance (WB)

Shoot in JPEG and your camera applies the selected White Balance to the images. In Raw, you can change it later in post-production to suit your tastes or salvage images taken using the wrong WB preset.



2) Exposure

While there are limits to what is possible, you can pull a lot more information from a poorly exposed Raw file than you can from a JPEG. Such versatility allows for special uses, such as HDR images.



3) Image quality

JPEGs made in-camera are very good quality, but can't match a Raw file for detail. Also, while it's hard to spot unless scrutinised carefully, JPEGs from Raw are better than in-camera JPEGs.

**Get ultimate quality!**

Capturing a scene in Raw format retains all the data you need to create an image with perfect exposure and maximum detail.

Navigating the Adobe Camera Raw interface

New to ACR and confused by all its features? No fear, we will make it clear...

PREVIEW OPTIONS

To see how your adjustments affect your image, make sure this *Preview* box is ticked. The button to the right expands or reduces the size of your interface.

The toolbar



Zoom: Magnify the image to see it in more detail by clicking on the preview image.



Hand: Navigate around the magnified image by clicking and dragging the Hand Tool.



White Balance: By clicking on an image area that's white or grey, ACR can determine the colour of the light the image was taken in.



Color Sampler: Allows you to select a colour that you want to adjust by clicking on that area of the image.



Targeted Adjustment: Instead of using the sliders to make adjustments, drag this tool on the image to make edits.



Crop: Perhaps one of the most useful tools, use Crop to change the aspect ratio, to recompose your image or simply remove elements from the edges.



Straighten: Correct a wonky horizon or rotate your image.



Spot Removal: Get rid of sensor spots, dust marks and other unwanted blemishes.



Red-Eye Removal: Click on the subject's pupil to get rid of red-eye in portraits.



Adjustment Brush: Use this tool to make localised edits to your image. See page 94 for more details on how to use it.



Graduated Filter: Draw a line across your image to apply a graduate effect. You can then adjust Exposure, Brightness, Contrast, Clarity, Saturation, Sharpness and Color of the graduate to suit your picture.



Preferences: Click here to access the Camera Raw Preferences dialogue box.



Rotate counterclockwise & Rotate clockwise: Click on the tools to rotate in either direction by 90°.



SAVE IMAGE...

Click here to open your Save Options. From here you can select your image Format, File Extension and level of Compression before naming and saving the file.

ZOOM

As an alternative to using the Zoom Tool, you can make more precise enlargements by selecting a percentage from this drop-down menu or using the + or - buttons.

WORKFLOW OPTIONS

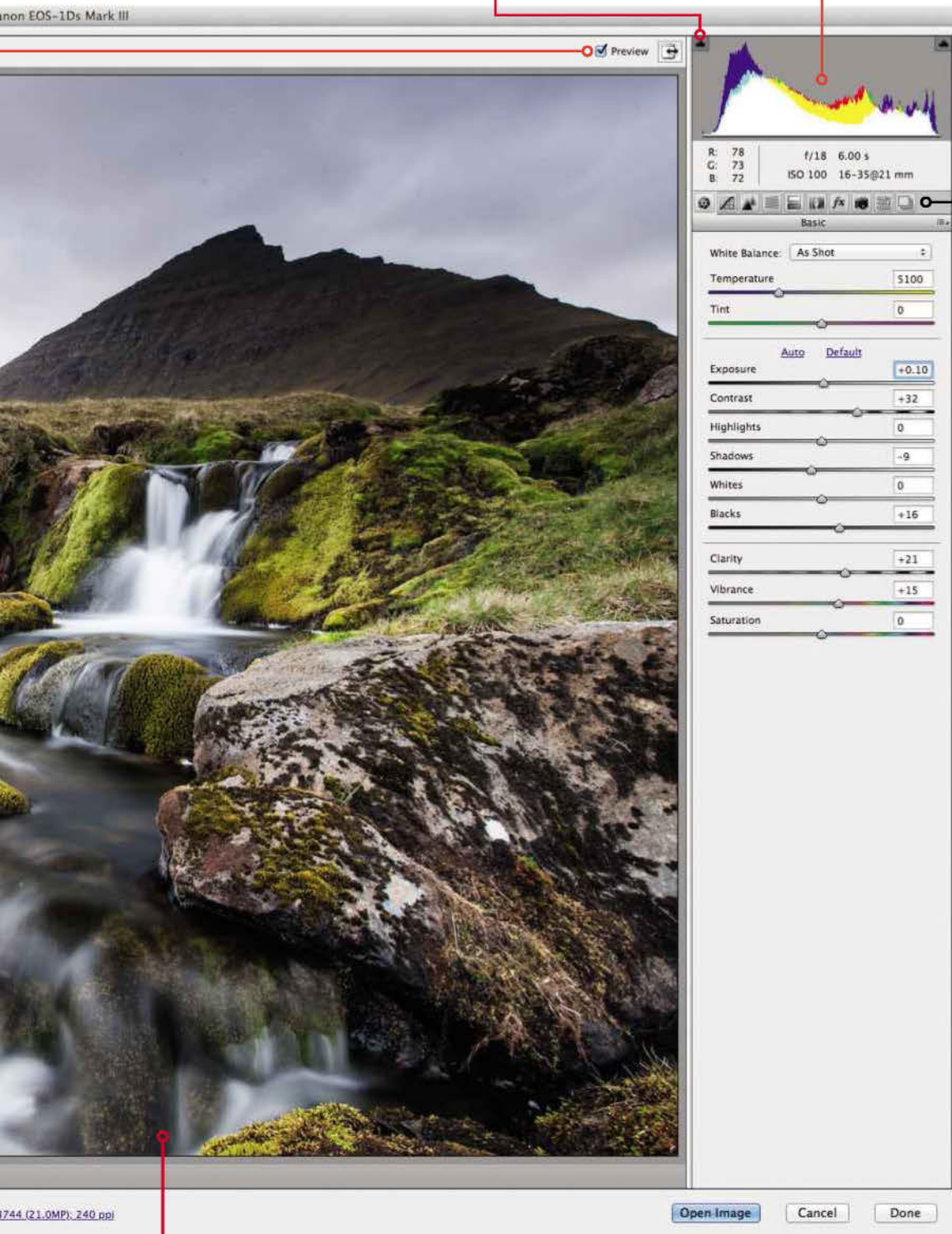
By clicking on this blue information line, you can select the best image space, resolution, size and depth to ensure optimum quality.

CLIPPING WARNINGS

Clipping is where detail is lost at the extreme ends of the histogram spectrum – these black and white triangle buttons, when pressed, activate warnings to indicate where clipping has occurred. Areas with lost shadow detail (right triangle) flash blue, while highlights (left triangle) flash red.

HISTOGRAM

Just like on your camera, the ACR histogram shows you the distribution of your exposure information from pure blacks to pure whites. It's a good reference for determining what adjustments you need to make. As you move the sliders, you'll notice the histogram changes its distribution.

**OPEN IMAGE**

When you've done all the editing you want to in Adobe Camera Raw, you have the option to open the image in Photoshop for further processing. Instead of clicking Open Image, hold **alt** to open the image as a copy – it's useful if you want to apply different techniques to the same Raw file in Photoshop. You can also press **alt** to change the Cancel button to Reset, reverting all sliders to default settings.

THE ACR INTERFACE

Adobe softwares have very similar interfaces and capabilities for using Raw, so whether you use Elements or Lightroom, the tools and techniques will generally translate.

Adjustments

Basic: Arguably the control room of ACR, these tools for the most part are all you need to dramatically transform your Raw images – turn over to find out exactly how.



Tone Curve: It functions in a similar way to Photoshop's Curves adjustment, allowing you to manually manipulate the tonal graph to affect your image's contrast.



Detail: You can access the Sharpening and Noise Reduction features of ACR via this tab. They're quite straightforward to use, but for more information and tutorials, turn to page 88.



HSL/Grayscale: This tab holds most of the controls you need to alter colour. You have HSL (Hue, Saturation and Luminance adjustments) as well as a Convert to Grayscale box that allows you to use the Grayscale Mix sliders to adjust the various grey tones in your image to improve contrast.



Split Toning: Want to be a bit more creative with colour? The Split Toning tab enables you to adjust the Hue and Saturation of the highlights and shadows separately for duotone results.



Lens Corrections: A really useful feature and one tab we recommend visiting before you do any editing, especially if you've shot with a wide-angle lens and your image has barrel or pincushion distortion, fringing or vignetting.



FX: The Effects tab features the more creative adjustments. You can add grain and apply a vignette for artistic results. See page 89 for details.



Camera Calibration: Use this tab to apply your in-camera styles, like Vivid and Landscape. You can use the Camera Profile sliders to help calibrate your on-screen image to match your LCD view, if needed.



Presets: Create your own presets so you can apply creative or routine tweaks with one click. Simply click **New Preset** and then record the adjustments.



Snapshots: Take 'snapshots' of your editing as you go along to compare the results or to quickly and easily return to an earlier state.

How to process a Raw file

Get the most from every image by processing in Adobe Camera Raw

THE BEST THING about shooting in Raw is that you can process the file to give a far better result than if you had captured the scene as a JPEG. The preview of a Raw file on your camera's LCD monitor may look identical to a JPEG as all the additional information is hidden within the file, and it's impossible to display on your camera's screen. It's only when you open the Raw file on your computer that you'll see the wonders retained in this purest of image file formats. Our step-by-step guide shows how processing Raw files in Photoshop's Adobe Camera Raw allows you to extract an amazing amount of information that leads to a far superior result than if the image had been captured in JPEG.



1 Open the file The first thing we do when we open our Raw file is to see how the histogram looks with the default Camera Raw settings. We can see here that contrast is fairly low with the bulk of the information for this image sitting in the middle. The image looks quite muted and would benefit from extra contrast to add colour and detail.



2 Assess the highlights First check if there's any highlight detail that might be clipped by clicking on the triangle on the top right of the histogram to turn on the highlight clipping display. When active, any clipped areas flash red. The whites of the distant lighthouse here are clipped, which means we might potentially lose some highlight detail.



3 Rescue the highlights You can recover this highlight information using the Recovery slider, but this would be at the expense of highlights elsewhere, which would effectively reduce contrast. The small amount of clipped information isn't that important, so we decide to leave things be. Exposure looks spot on so we don't need to adjust this slider either.



4 Boost the blacks The image probably looks a little flat straight from the camera, like this one does. Adjust the Blacks slider until the histogram spreads towards the far left side by holding down alt/Option and moving the Blacks slider until areas show up black on the white background. You've now created the pure blacks in your image, but be careful not to overdo it.



5 Watch for clipping You'd normally look to avoid clipping any highlights or shadows, but sometimes it's necessary in order to strengthen the dark tones and improve contrast. For instance, here we wouldn't expect to see detail in the rock face cracks. We also set Contrast to +60 to boost contrast further without clipping too much more shadow detail.



6 Boost the colour Now adjust the Vibrance slider (here we set it to 30), or the Saturation slider if your software doesn't feature Vibrance, to pump up the colour a little. Press I to access the White Balance Tool and check that you have got the correct White Balance by clicking on a neutral white or grey area – the lighthouse is good here.



Final image
It's clear to see the benefits of shooting your images in Raw, as it's possible to extract far more detail than if you had taken the shot as a JPEG.



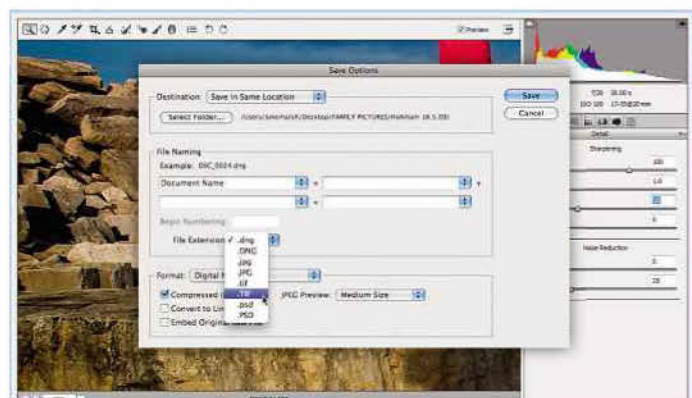
7 Adjust the White Balance If you're not happy with the image's colour tone (White Balance), adjust the Temperature slider a little. You can strengthen contrast a little further if you feel it's necessary by clicking from the Basic tab to the Tone Curve tab. Select Point rather than Parametric and change the drop-down menu from Medium to Strong Contrast.



8 Add impact For this image, we want to emphasise the sky and sea a little more with a selective Saturation and Luminance increase. We chose the HSL/Grayscale tab and selected the Saturation sub-tab and set Blues to +40. We then chose the Luminance sub-tab and set Blues to +40 here, too. As you can see, these tweaks all result in the image delivering far more impact.



9 Sharpen the image Next, it's time to negotiate the Detail tab and use the Zoom buttons to zoom in to 100%. Work with the Sharpness slider to get the image looking crisp on screen. We settle on Amount 100, Radius 1.0 and Detail 30. Sharpening too excessively can cause artefacts and noise to appear, which is why it's important to take pictures at the lowest ISO rating possible.



10 Save and open Once you're finished, you can either open the image to continue enhancements in Photoshop or save it for later. By saving the image as a .TIFF or .PSD format you will leave yourself with a 16-bit file as opposed to compressing the image to an 8-bit JPEG, which reduces the amount of information and thus flexibility when editing in the future.

White Balance

Understand colour temperature to ensure that your images look exactly as you expect them to

AS WELL AS varying enormously in terms of its harshness and intensity, light also changes colour. Natural daylight can be warm or cold depending on the time of day and weather conditions, while man-made illumination can take on pretty much any colour. Our eyes automatically adjust to changes in the colour of light so everything looks 'normal' – white always looks white regardless. But your camera isn't as clever as that, which is why you'll sometimes take shots that look warmer or cooler than the scene does to the eye. To avoid this, your DSLR has a range of White Balance presets that match specific types of natural and artificial lighting to eliminate unwanted colour casts. The majority of photographers will probably never use them and instead leave the camera set to Auto White Balance (AWB). However, it's worth experimenting with the other presets, for technical and creative reasons – as you're about to find out.

COLOUR TEMPERATURE

The colour of light is expressed as colour temperature and measured using the Kelvin (K) scale. Daylight on a sunny day is considered neutral and has a colour temperature around 5500K – as does electronic flash. At sunrise and sunset the light is warmer and its colour temperature is lower – around 3000K. Candlelight has an even lower colour temperature, around 2000K, while tungsten lighting has a colour temperature around 3400K. When the light is above 5500K it starts to appear cool. In cloudy weather the colour temperature is around 7000K, for example, much like shade in sunny weather, while at high altitude the colour temperature can be as high as 10000K.

If you set your DSLR to Daylight WB and shoot in tungsten light your shots will come out with a warm cast because the sensor has been calibrated to produce natural colour in light at around 5500K – tungsten light has a much lower colour temperature. Similarly, if your shots come out with a cool cast it's because the light had a higher colour temperature than 5500K.



Sunset light is around 3000K, whereas shade is around 7000K

LEIFROST

How to change White Balance

SELECTING WHITE BALANCE

The fact that White Balance is one of the key functions involved with image characteristics means that a button allowing fast access to WB is prominent on all brands of camera. It's normally found on or close to the four-way control and Set button, which is used to select the WB presets. Most have the same set of presets, although some of the more advanced models offer additional choices, such as more than one form of fluorescent. For White Balance bracketing, you'll need to access the main Menu.



- 1) Press the WB button on the four-way control on the camera's rear, select the preset you wish to use, then press SET.
- 2) With newer models, the White Balance can be accessed by pressing the Q button.



- 1) Press the i button and use the four-way control and OK button to select a preset.
- 2) With older or advanced models, press the WB button to the left of the rear LCD monitor – presets are shown on the top-plate LCD.

White Balance presets



AUTO WHITE BALANCE (AWB):

The default WB setting used by most photographers. It works by evaluating the colour balance in a scene and deciding on the best White Balance to record a natural image. More often than not it does a great job under scenes with a colour temperature between 3000-7000K, but in unusual or low light you may find you get better results using a fixed WB preset.



CLOUDY:

If a cloud obscures the sun, the colour temperature of the light increases a little to around 6000K – rather like in shaded areas, but not quite as much. This could cool your shots down, though as the temperature shift is small you may not see much of a difference between Cloudy and Daylight presets. In overcast weather, you may find that the Cloudy preset gives more balanced results.



FLASH:

Electronic flash – be it your DSLR's integral flash, a flashgun or studio flash – produces light with a colour temperature very similar to 'average daylight' – 5500-6000K. You could manage fine with your WB set to Daylight, especially if you're using flash mixed with daylight. However, if flash is the only source of illumination, then it's worth using the Flash preset for increased accuracy.



DAYLIGHT:

The best preset to use when shooting in normal daylight conditions. It's balanced for a colour temperature of 5200K, which is what you'd expect on a sunny day – it's ideal for outdoor photography whatever the subject. If you shoot at sunrise and sunset with your WB set to Daylight, the images will come out on the warm side – but that's a good thing as warm light usually looks great.



TUNGSTEN:

If you shoot under tungsten lighting with your WB set to Daylight, the images will come out with a yellow/orange cast as the colour temperature of tungsten is very low – 3200-3400K. Auto White Balance usually gives decent results, but using the Tungsten preset is best as it's balanced specifically for tungsten lighting – though any areas in the shot lit by daylight will come out blue.



CUSTOM:

Allows you to create a WB setting based on the colour balance of a specific situation. This is done by taking a test shot of a white or grey card, and then allowing the camera to adjust WB to ensure that the card comes out neutral. In doing so, colour casts are eliminated in images taken in the same light. Custom WB is often used under specific lighting when colour accuracy is key.



SHADE:

The light is softer in the shade than it is in full sun, so when shooting portraits or close-ups you may choose to step into the shade or block the sun to create your own. Either way, by doing so you may find that your shots look cooler as the colour temperature in shade is often around 7000K – higher than daylight and therefore bluer. Setting your WB to Shade gets rid of the cool colour cast.



FLUORESCENT:

Fluorescent lighting has always been tricky to balance as there are different types of fluorescent light, the colour temperature of each one is different and it also changes over time as the light gets older. This preset offers an average adjustment, intended to give fairly accurate results with any type of fluorescent. It adds magenta to get rid of the green colour cast caused by the light.



COLOUR TEMPERATURE:

Another way to achieve accurate colour balance is by measuring the colour temperature of the light, then setting your camera to that exact temperature in ° Kelvin. This preset allows you to do exactly that, usually between 2500-10000K. This is rarely used; to measure colour temperature you'll need a colour temperature meter, which is a very specialist piece of kit.

ALL IMAGES: LEE FROST

PAUL WARD

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Make your tweaks

How well do you know your camera's set-up menu and custom functions? Hidden away in these menus are settings that control virtually every aspect of your camera's behaviour. It's worth spending time customising it to work the way you want. Here are some of our favourites...

File numbering

With this setting, choose whether you want to start numbering images from 0001 every time a new card is inserted, or number your shots continuously. We'd recommend the latter, otherwise you can end up with different pictures with identical file names, meaning you could accidentally copy over one image file with another. Some cameras also let you change the letters at the start of each file to your initials (for example: DPL0127.jpg).



Set up your input dials

If your camera has two input dials, and it's annoying you that the thumbdial adjusts shutter speed while the front dial under your forefinger controls aperture, then it will be welcome news that some cameras allow you to swap this functionality around. You can also often specify in which direction the dial turns to increase or decrease the value. On a similar theme, some Olympus models even allow you to swap the direction in which the focus ring is turned!



Audible 'beep'

The world is divided into those who like a loud beep to tell them their camera has achieved proper focus, and those who find this sound irritating. If you're in the second of these camps, look for the setting in your camera's menu system to silence the sound.



Viewfinder grid

If you are one of those people who can never hold their camera level, resulting in wonky horizons, then the ability to switch on grid lines will be a bonus. Other manufacturers let you view grid lines when composing in LiveView, which proves particularly useful for architectural photography.



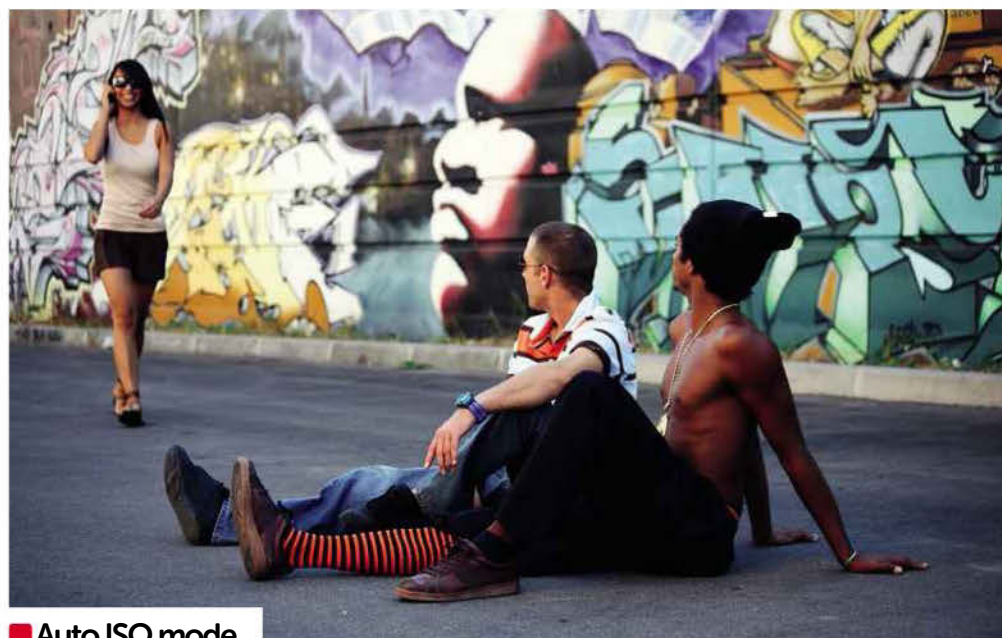
Function button

Many DSLRs and CSCs offer a Function button that you can set to perform one of a number of predetermined options. These tasks can include activating LiveView, switching to RAW mode, activating a particular metering pattern or selecting a certain AF area mode.



Set your camera the way you like it!

In less time than it takes to drink a cup of tea, you can learn something completely new about your digital camera that will change the way you take pictures forever. Don't believe us? We're about to prove it to you – guaranteed!



ISTOCKPHOTOS

Auto ISO mode

In the days of film, you picked your ISO rating and you stuck with it for the next 36 frames. In the digital world, though, ISOs have become another variable, just like apertures and shutter speeds. You can change them in halves or thirds of a stop over a range of some seven stops, depending on your camera. That's more than the aperture range in some standard zooms.

To reflect this, most DSLRs and CSCs have an Auto ISO setting where the ISO is raised automatically as light levels dim, usually in order to maintain a shutter speed for shake-free handheld shooting. Some Pentax DSLRs even go so far as to include an ISO priority mode (SAv), where the shutter speed and aperture are both locked and it is only the ISO that is changed in response to changing light. Auto ISO is a particularly useful function for the street photographer. When light levels are changing, but you are working quickly, you don't always have chance to notice whether your shutter speed has dipped into the camera-shake territory or not, and up the ISO to compensate. Why not let your camera do this for you?

Many DSLRs and CSCs allow you to customise their Auto ISO option, specifying a minimum shutter speed after which the camera will start to change ISO instead. You'll also be able to specify the maximum ISO value here, which is crucial if this feature is going to work for you, for as the ISO climbs higher, picture quality tends to degrade, with noise becoming more apparent. Experiment with your camera to find your own ISO limit – a setting which you're happy to work at, but not beyond. If you are lucky enough to have a high-spec full-frame camera – like a Canon EOS 5D Mk III or Nikon D800 – then this could be some ISO 3200 or higher. Back in the real world, though, it's more likely to be around ISO 800-1600 on a model like a Canon EOS 700D or Nikon D3300.



LiveView mode

LiveView lets you compose a picture on the rear monitor – as you might with a compact camera – instead of through its viewfinder. When it was first introduced, many labelled it a gimmick, but since then more and more uses for this technology have emerged. The most obvious use for LiveView is working at different viewpoints without pulling a muscle. Shooting from down below or over heads in large crowds is much easier this way. There are other advantages, too. Some argue that it's easier to see whether a composition will work or not by using the LCD monitor and not the viewfinder – and if you set your camera to black & white mode, it's possible to preview the scene in front of you in mono. Furthermore, on some DSLR and CSCs (Canon and Pentax particularly), LiveView is carried out using the aperture set on the camera, which means you can preview depth-of-field and the effect of ND grad filters.



LiveView can be useful for composition.



Picture Styles/filter effects

The great thing about digital photography is the control you have over factors such as colour saturation, contrast and sharpness when editing pictures on your computer – but did you know you can also do this in-camera? Most DSLRs and CSCs offer the facility to tweak image settings like this. Some have predetermined picture settings, such as Landscape or Portrait, while others give more individual control over settings like brightness, contrast and saturation, letting you save these as presets. If your camera offers manual control over picture settings, here's one to get you started: try reducing the colour saturation as much as you can without making the image completely mono, and then pump up the contrast as high as it'll go. You'll get a hard, gritty look that is great for striking portraiture. Landscapers may like to try the opposite – boosting saturation and leaving contrast set to normal.



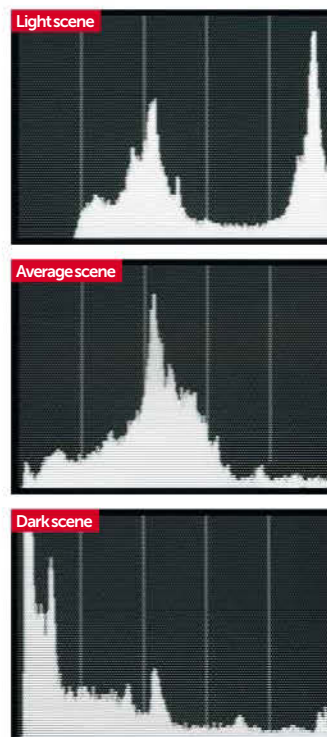
ABOVE: Select Picture Style from the menu and choose from the options.

Using your histogram

Take a picture on your DSLR or CSC and we bet the first thing you do is take a good long look at the back of your camera to review the picture on the LCD monitor. Nothing wrong with that, of course – it's one of the best things about digital photography – but can you really believe what you are looking at in this preview? Well, yes and no. You can zoom in and check that the sharpness is okay, and, of course, it'll show your composition and framing, but when it comes to exposure, the humble screen doesn't always show the truth. It can be influenced particularly by ambient light – bright sunlight can make pictures appear underexposed, while dim conditions will make things look too bright. The answer is to use your camera's histogram. This is a graphic representation of how the various tones are distributed throughout the picture: on the X-axis are tones, from pure black on the left-hand side to pure white on the right. On the Y-axis is the number of pixels in the scene that have a specific tone.

Rather than interpret the histogram in terms of hard and fast numbers, it's better to look for trends and shapes. For an average, properly exposed scene that contains a variety of tones, you'd expect to see an even distribution of tones throughout the histogram. If the scene is underexposed, though, the histogram will be skewed to the left-hand side (the black end). Likewise, if overexposed, the peak will appear on the right of the scale. This is a much more reliable indication of exposure accuracy than looking at the image itself.

This is, of course, only true for 'average' subjects. Shoot a high-key or low-key scene (ie one filled mostly with dark or light tones) and you should expect to see your camera's histogram biased towards one end of the scale anyway. Again, once you know what to look for in a histogram, you can use it to gauge just how close you are to getting the perfect exposure.



Auto Image-review off

One feature that divides opinion almost as much as the audible beep is the auto-image review. This is where the image of the last frame taken appears on the LCD screen shortly after firing the shutter. Not only does this use extra battery power, it can be quite distracting when looking through the viewfinder. Some photographers switch off the instant playback for another reason, too – it's too tempting to check it straight away, and while you are looking at the screen, you could be missing out on other good photo opportunities. Some cameras also have an auto-power off function, designed to save battery power. This can usually be disabled or extended in the camera's menu system as well.



Shutter release w/out card

This is a setting to find, switch off and leave alone. We recommend you never have your camera set so it can fire with no memory card in it. It'll only be a matter of time before you make the ultimate mistake and take a dozen (great) shots, and fail to record any of them!



AF/AE Lock

One of the most useful custom functions dictates how the AF and AE locks work. Everyone has their own preferred way of working, so it's good that you can customise this control so well. For instance, when you half-press the shutter release, do you like both the exposure and focus to lock? Or just the focus? Or just the exposure? Maybe you like the exposure to lock when you hold down the AE-L button. Or maybe you want it to lock when you simply press the AE-L button once, and not unlock until it's pressed again. Whichever way you prefer to work, it's most likely your DSLR or CSC can be set up to work that way.



Screen brightness

Struggling to see your screen in the bright sunlight? You can turn its brightness up in your camera's menu. Or turn it down if you want to save battery, or are working in dim conditions at night.



Creating 'My Menu'

Having read this far and discovered a few new things about your camera just by playing with it, you'll have learned a lot about how your camera works. You may also be irritated because you can't remember which menu is home to a specific function. Usefully, some DSLRs and CSCs have a custom menu (often called My Menu) that you can set up for fast access to your favourite commands. Give it a try!



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7

FPS



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At the heart of the image



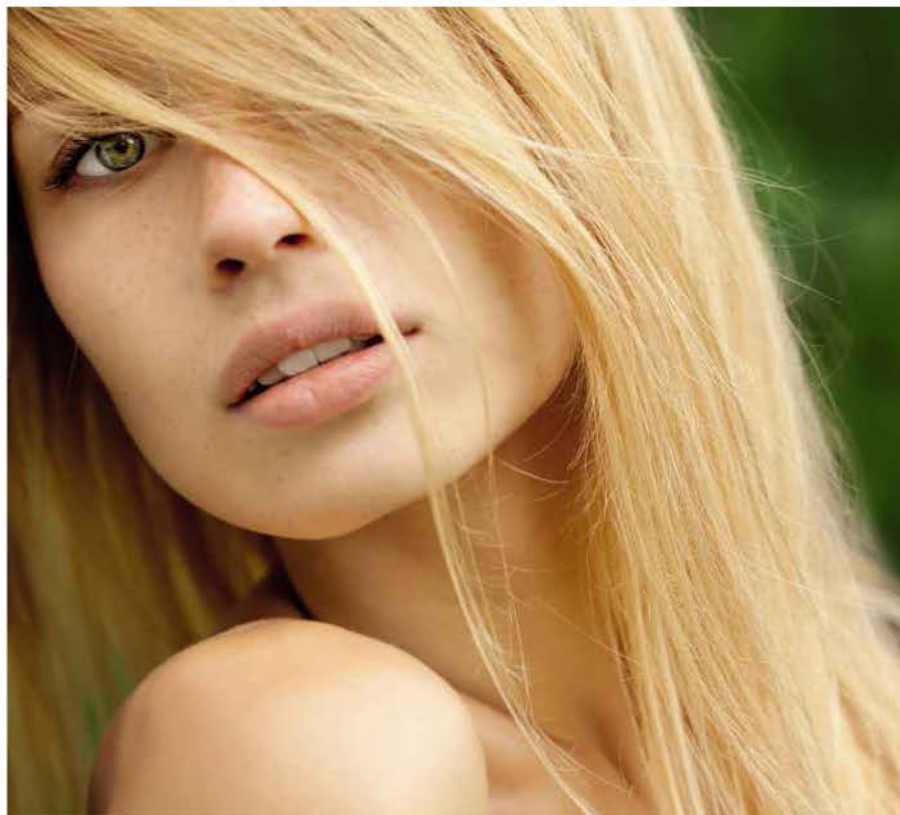
THE FUNDAMENTALS

THE ESSENTIAL PRINCIPLES TO HELP YOU TAKE YOUR BEST-EVER PHOTOGRAPHS...



Improve your composition

There are a number of factors to consider when looking for your best shot – here are some inspiring guidelines worth remembering



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■ CREATIVE CROPPING

Although we would advise you to always compose images in-camera as you want them to be, the fact is, in this digital age, it's quick and easy to crop an image during post-production if you're not happy with it. There's nothing wrong with this, providing it's occasional rather than all the time. Cropping can be used to completely change the look and feel of an image and give it a new lease of life. You may find that some shots work better cropped to a panorama, for example, but you

didn't think to shoot a 'pan' at the time. This doesn't just apply to landscapes either – try cropping architectural shots, abstracts, still-life images, patterns, even portraits to the panoramic format. Cropping to a square will also change the mood of an image because the symmetry of the square format makes it more balanced and tranquil.

Experimenting with cropping is fun and can be productive – but you don't have to worry if it doesn't work because you'll always have an uncropped version.



LEE FROST

■ LOOK FOR SYMMETRY

Although seeking out symmetry in a scene appears to break the rules of composition as it usually involves placing the horizon across the centre of the frame, or the main subject in the middle of the shot, used in the right scene or with the right subject, it can produce fantastic images.

Reflections are a common form of symmetry, and who can resist them? You'll find lots of symmetry in architecture and engineering – suspension bridges, office buildings, the underside of old piers, the structure of an electricity pylon from underneath, and so on. Symmetry can also be created using mirrors to reflect your subject – try it when shooting portraits, or have fun with your kids in a Hall of Mirrors at a funfair. Look for symmetry in nature, too – avenues of identical trees, fungi growing on a tree trunk, a spider's web in close-up...

The key to shooting symmetry is finding the right viewpoint. If that symmetry exists in reality rather than as a reflection, there will be a prime position from which to see and shoot it. Keeping your camera level and square will also help you achieve perfection.

Of course, the alternative is to cheat! To create symmetry, crop out one half of an image, make a copy of it, flip the copied half horizontally then join the two halves together using the Move Tool in Photoshop. Voilà – instant symmetry whether it existed or not! This technique works well on architectural subjects but can also produce some unusual face-flipped portraits!

■ EXPLOIT SCALE

Another way of implying distance and depth in a photograph is by including features that help us to quantify the scale of a scene. People are the most obvious choice as the human body is relatively consistent in size. If you capture a person dwarfed by a waterfall, for example, it immediately becomes clear that the waterfall is huge; without the person we wouldn't necessarily have anything to compare it to. Other features of relatively consistent size can also be used to suggest scale – trees, buildings, animals...

For the strongest effect, make the feature you're using for scale small in the frame and use a telephoto lens to compress perspective so the large and small elements appear close together. Wide-angle lenses aren't so good for emphasising scale as they stretch perspective – in fact, they can reverse the effect by making foreground elements appear larger than those in the distance.

Sometimes, of course, it works in your favour when you intentionally avoid any scale reference because it creates a sense of intrigue. Ripples on a sandy beach could easily be an aerial shot of sand dunes in a desert, for example, while a close-up of the texture in rock could be a shot of the Grand Canyon. Without something to give us a clue of the scale, it can be impossible to tell.



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PERSPECTIVE

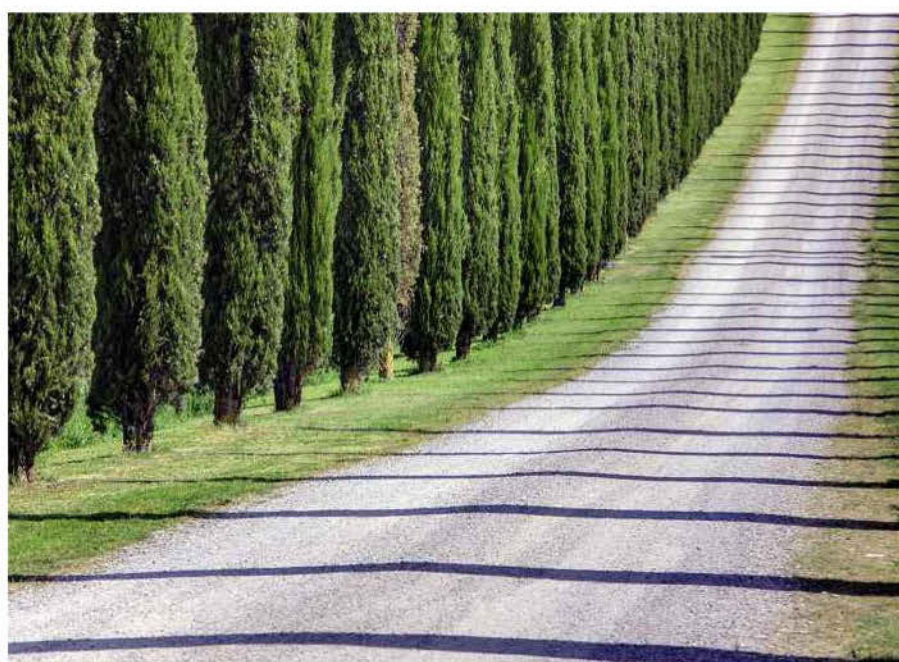
Although photography is a two-dimensional medium, we can capture an impression of depth by exploiting perspective. The most common feeling of depth is created by overlapping features – if one mountain partly obscures another, there must be distance between them. However, there are other more effective forms of perspective.

Diminishing perspective relies on the fact that the further away an object is from us, the smaller it appears. If you stand next to a building, for example, it will dwarf you, but walk down the street and it will appear much smaller. This is why including foreground interest in a wide-angle landscape gives a strong feeling of distance and depth – the old wooden gate you use to fill the foreground appears far bigger than the hills in the distance, so the hills must be far away.

Another way to exploit diminishing perspective is by photographing a series of similar-sized objects – an avenue of trees is a good example. The tree closest to the camera will appear to be tallest and the one furthest away the smallest, with each tree appearing smaller than the one before.

Aerial perspective is based on the fact that colour and tone diminishes with distance due to atmospheric haze, mist and fog. If you gaze across a mountainous scene at sunrise, for example, the mountains closest to the camera will appear darker in colour or tone than those further away.

The same applies with trees in mist, or the



LEE FROST

undulations of a rolling landscape. To emphasise the effect, use a telephoto zoom lens and home in on the more distant parts of the scene where the haze or mist is stronger.

Aerial perspective can also be implied by use of colour. Cool colours such as blue and green appear to recede, so they make ideal

background colours to objects with warmer hues such as red, orange and yellow which are said to 'advance'. You can make use of this by composing photographs with warmer colours in the foreground, such as a bed of spring flowers, against more distant green foliage and blue sky.



■ THE RULE-OF-THIRDS

If you want to create balanced compositions that are easy on the eye, you could do a lot worse than follow the rule-of-thirds. This age-old compositional device was originally devised by painters, but it works just as well in photography and provides a very useful platform on which to compose your images.

To use the rule-of-thirds, divide your

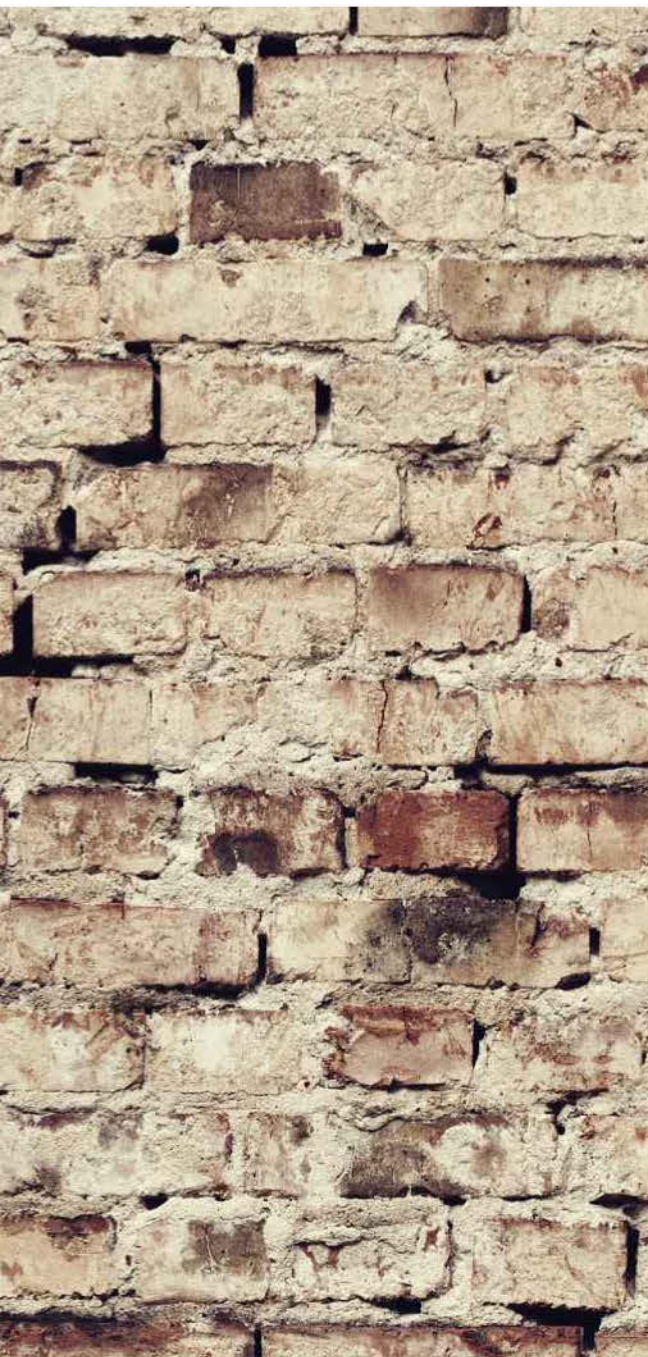
camera's viewfinder into a grid of nine equal rectangles using two imaginary horizontal and vertical lines. If your DSLR has a grid focusing screen, you may find that it's divided according to the rule-of-thirds, which would be a real bonus. Either way, the grid divides the image area into three horizontal bands and three vertical columns and both the lines and intersecting points of the grid can be used to position the features in the scene.

For example, if your composition has a focal point – a barn in a field, a boat on a lake, a tree on a hilltop – you can place it on one of the four intersecting points created by the grid, which in most cases (but not all) works far better visually than if you stick it in the middle of the frame. Actually, with landscapes, the best intersecting point to use is the top right one, because the eye tends to scan a scene from bottom left to top right, or left to right, so if you position the focal point off to the right

and towards the top of the frame, the eye will take in most of the scene before reaching the focal point and this tends to hold the attention for longer. But if you were photographing someone walking along a beach, for example, the bottom right intersecting point would be better, especially if there was an interesting sky to include in the shot.

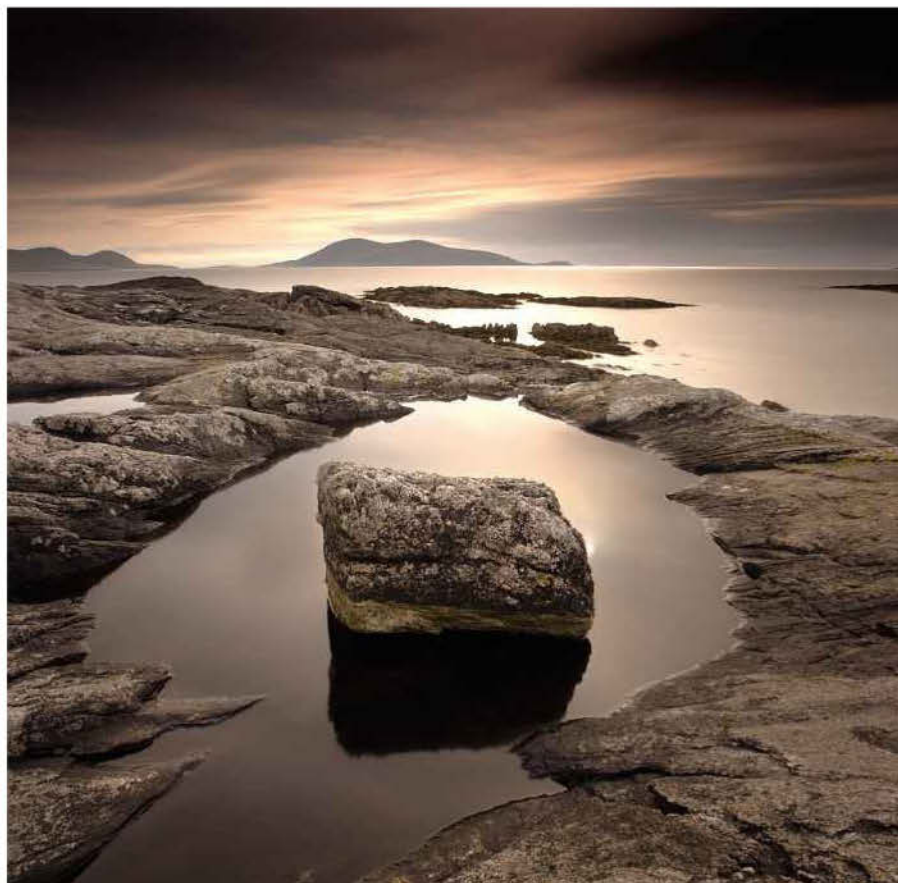
You don't have to limit the rule-of-thirds to scenic shots either. When shooting portraits, for example, you could compose so that your subject's eyes or head are positioned on one of the intersecting points. The same applies when shooting close-ups, architecture, action, still-life, even abstracts.

The lines created by the rule-of-thirds grid can also be used to help achieve balance in your composition. For example, it's tempting to place the horizon across the middle of the frame, but a better place for it, generally, is one third from the top so you're emphasising the



foreground, or one third from the bottom so you're emphasising the sky. The same applies with other natural or assumed lines in the scene. The vertical lines serve a similar purpose when it comes to positioning vertical features. If there's a tree or a person in the scene's foreground, for example, place them on the right-hand vertical line so the eye scans across the image to them.

Often you'll find that you're using the rule-of-thirds multiple ways in the same composition – to position the horizon and the focal point, or to position multiple focal points in the shot. You should never force your compositions to comply to any rule, but if it works, give it a go. Initially you'll have to think about what you're doing, but after a while it becomes instinctive and you will naturally compose this way. It won't always work, but by that stage you'll be able to recognise when it does and doesn't, and act accordingly.



LEE ROST

■ FOREGROUND INTEREST

One of the most important elements you can exploit to create a dynamic composition is foreground – the area of a scene closest to the camera.

Foreground interest is useful for a number of reasons. First, emphasising it will give your images a strong sense of distance, depth and scale due to the effects of perspective, as well as providing a convenient entry point into the composition from which the viewer's eye can then naturally travel up through the scene to the background. Second, the foreground contains more information than the rest of the scene and being close to the camera isn't affected by atmospheric haze, mist and fog like features that are more distant – an advantage when shooting landscapes.

The strength of the foreground is controlled mainly by lens choice – the wider the lens, the more foreground you can include. Moderate wide-angle focal lengths around 15–18mm (24–28mm full-frame) are ideal as they're wide enough to include lots of foreground but not so wide that the rest of the scene seems to disappear in the distance. If you go wider – down to 10mm (16mm on full-frame) – you can create incredibly powerful in-your-face images, but you need to get in close to the foreground otherwise the composition will look 'windy'. Composing in portrait format also lets you include much more of the foreground vertically and this can make a huge difference to the impact of the image, especially when the foreground features form vertical lines.

What can be used as foreground interest?

Pretty much anything – rocks, rivers, walls, gates, fences, trees, moored boats, flower beds, reflections and people. Features and elements in the scene that create natural or assumed lines work best as they lead the viewer's eye into the scene.

The main thing to remember – when shooting wide-angle landscapes in particular – is that the foreground must be interesting otherwise you'll struggle to engage the viewer's interest. Equally, avoid foregrounds that are too fussy or they will overwhelm the rest of the scene.

Finally, you will usually want to record the whole scene in sharp focus from front to back and when you're including near foreground in the composition, this requires care. Hyperfocal focusing is the best way to maximise depth-of-field without having to stop your lens all the way down to minimum aperture. Look it up online if you're unsure, but it basically involves focusing on a specific distance to maximise depth-of-field for a given focal length and aperture. To give you an idea, if you stop your lens down to f/11, the hyperfocal distances for different focal lengths are:

For DSLRs with an APS-C sensor:

For 10mm – 0.5m; For 12mm – 0.7m;
For 16mm – 1.2m; For 20mm – 1.8m;
For 24mm – 2.5m; For 28mm – 3.5m.

For full-frame DSLRs:

For 16mm – 0.7m; For 20mm – 1.1m;
For 24mm – 1.6m; For 28mm – 2.2m;
For 35mm – 3.5m.

If you focus on the distance specified for a particular focal length, and set your lens to f/11, depth-of-field will extend from half that distance to infinity. Easy!



■ CREATIVE FOCUSING

Although we often tend to focus in a conventional manner – small apertures to achieve lots of depth-of-field when shooting landscapes or a wide aperture to blur the background of portraits – focusing can be used in a much more creative and unusual way, too.

For example, instead of focusing on your main subject, focus on the immediate foreground and shoot at a wide aperture so depth-of-field is reduced and the part of the composition we expect to be sharp is blurred. Try the same idea but focus on the background, so it comes out sharp and anything in front of it is blurred – a weird twist on convention. Or why not throw caution to the wind and intentionally defocus your lens so everything is thrown totally out of focus, making it impossible to determine what the subject matter is?

Out-of-focus areas can be used to direct the eye on the main subject, which is sharply focused, by making it stand out. This technique, known as 'differential focusing', basically involves using your

lens at its widest aperture so depth-of-field is very shallow and only a narrow band of sharp focus is achieved. Try it when shooting close-ups of flowers, using your macro lens at its widest aperture and focusing carefully on one area. In the landscape, use a telezoom to focus on something in the distance, like a tree or a horse in a field, and allow the foreground to fall out of focus. This effect works well in backlit situations when colours are muted and the scene is full of atmosphere. Differential focusing is also ideal for still-life shots of objects laid down, such as a guitar, and shot from an angle so that when you focus on one area, the rest gradually falls out of focus.

You can use the same idea in portraiture, posing one person close to the camera and another one further away, then focusing on the person in the background so the one nearest is out of focus. Or instead of a second person, stand close to something like a lamp post or door so it's thrown out of focus when you focus on your subject.



LEE ROOST

POINT OF VIEW

The vast majority of photographs are taken with the camera at eye level. Nothing wrong with that – it gives us a realistic view of the world. However, realistic doesn't necessarily mean exciting, and by intentionally shooting from alternative viewpoints, you can add a sense of surprise and drama to your shots.

Shooting from a low viewpoint with a wide-angle lens will introduce more distortion, with features close to the camera dominating the composition and verticals converging dramatically. Because you're forced to look upwards, you can also make the sky a more integral part of the composition – it effectively becomes the background. Try shooting with the camera held just a few inches above the ground – shoot blind, check the image and try again if it doesn't quite work. More and more cameras are being made with vari-angle LCD monitors, so you can shoot from unusual viewpoints but angle the screen so that you can see what you're getting and have some control over the composition.

High viewpoints offer a fascinating bird's-eye view of the world – you can take amazing shots from tall buildings and monuments, looking down on the streets below. Use a wide-angle lens so you can include the horizon or a telezoom to home in on details far below. On a more grounded level, it's always worth exploring a scene or subject from slightly different viewpoints before committing to any one because slight changes of camera angle can make a big difference to the final composition, especially when shooting with a wide-angle lens. Even bending your knees can change the dynamic of the image completely, or shooting from a wall so you get a more elevated view.

LEE FROST



LEE FROST

USE FRAMES

Another useful way of creating an interesting composition is by framing a subject or scene with features close to the camera, such as the overhanging branches of a tree, a gap between trees or bushes, a window or doorway, the mouth of a cave...

An immediate benefit of doing this is that the frame helps to direct attention towards the most important part of the shot. Frames can also be used to obscure unwanted details such as road signs or parked cars, and to fill unwanted space such as a boring sky.

Wide-angle lenses are ideal for emphasising frames as you can move close to any suitable feature and control how much of the composition it occupies by fine-tuning your viewpoint. If you stand beneath a tree, for

example, the branches will frame the top of the photograph, while if you stand in an archway, the top and sides of the image will be framed.

Setting a small lens aperture such as f/11 or f/16 will provide sufficient depth-of-field to record the frame and the scene beyond in focus – especially if you use hyperfocal focusing to maximise depth-of-field.

If the sun is anywhere but directly behind the camera, the frame itself will be in shadow and record as a silhouette or semi-silhouette. This can further emphasise the effect of the frame, but care needs to be taken when determining the correct exposure as the shade created by the frame can fool your camera's metering system into overexposure – reducing the exposure by a third or two-thirds of a stop should do the trick.

KEEP IT SIMPLE

Try adopting the KISS approach to composition – Keep It Simple, Stupid! Cluttered compositions lead to sensory overload, and instead of holding attention often lose it because the viewer can't quite make out what's going on. But once you start stripping away unnecessary details and elements of a subject or scene, you'll quickly realise how little is really required to create a photographic masterpiece – and how many opportunities there are out there to produce minimalist compositions.

Shooting in mist or fog can help because scenes are simplified, fine detail is lost and the landscape takes on a minimalist form. Everyday things such as lamp posts, trees and telegraph poles peering out of the gloom work well. Don't shoot a bunch of them, though – just the one will be enough.

Bridges, roads, paths and fence lines work well, too, because they slowly fade to nothing, leaving the viewer wanting and wondering. Same with lakes, lochs, rivers and ponds. In mist or fog, the far bank is

often obscured. Grey water merges with grey mist and islands seem to float in a sea of nothingness.

Where nature doesn't simplify the scene for you, home in on selected areas and exclude anything overcomplicating the composition. The longer the focal length, the narrower the angle-of-view and the more selective you can be.

In terms of subjects, anything and everything suits the KISS approach. Architecture is a good start, especially modern architecture, which tends to be minimal and full of shapes.

Out in the countryside, water is always a winner, especially when it's calm and reflective. You can find endless images in the water itself, but it also creates a simple background against which you can capture posts, rocks, trees and boats. Also look for jetties, piers, groynes and buoys – single, bold elements surrounded by open water and open sky. For added simplicity, attach a ten-stop ND filter and use a long exposure to blur motion in the water and sky.



ROSS HODDINOTT

ADAM BURTON



■ LEADING LINES

Natural or man-made lines are one of the most poignant compositional tools. As well as leading the eye into and through an image – which is why they're referred to as lead-in lines – they can also divide an image into different areas, or add a graphic element.

The most obvious lines are those created by man-made features such as roads, paths, tracks, bridges, telegraph wires, walls, hedges, fences and avenues of trees. Shadows, too, can create strong lines, especially when the sun is low. Natural features such as rivers and streams have the same effect as they wind through a scene into the distance.

Assumed lines can also be formed by the layout of features or objects in a scene, such as stepping stones across a stream. Although there is space between them, our brain automatically joins up the individual elements. The same applies with a person's gaze – we tend to follow their line of gaze to see what they're looking at.

1) Horizontal lines echo the horizon for a soothing effect. Man-made boundaries such as walls, fences and hedges are obvious examples, though shadows can also be used. The eye tends to begin at the bottom of a picture and work up, so horizontal lines divide it into sections that can be observed in turn. Use your camera in landscape format to make the most of horizontal lines.

2) Diagonal lines have great directional value and add depth as they suggest distance and



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perspective. As the eye tends to drift naturally from bottom left to top right, diagonal lines travelling in this direction have the greatest effect. In the landscape, roads, rivers, drainage ditches, rows of trees, hedgerows and other features can be used to form diagonal lines.

3) Vertical lines produce compositions with a stronger sense of direction. Think of the regimented trunks of trees and the soaring walls of skyscrapers. To maximise the effect, shoot with your camera in portrait format so the eye has further to travel from the bottom of the frame to the top.

Use the bold lines of trees and walls to frame the scene beyond, or fill the frame using a telephoto lens so that vertical features become more crowded together as perspective is compressed.



LEE FROST

4) Converging lines are the most powerful of all. If you stand in the middle of a long, straight road and look down it, you'll notice that, as distance increases, the parallel sides of the road appear to move closer and closer together until they eventually seem to meet at a place in the distance known as the 'vanishing point'. The same effect occurs with railway lines, paths, avenues of trees, bridges, the furrows in a ploughed field, rows of crops and so on. Converging lines add a strong sense of depth because, for example, you know the road is the same width along its length, so if it appears to become narrower, it must be travelling away from the camera. The converging effect is best emphasised with a wide-angle lens – the wider the better – so the lines appear wide apart close to the camera and rush away into the distance.

■ BREAKING THE RULES

While the rule-of-thirds and other compositional aids can create interesting images, breaking them can often produce more eye-catching photographs.

Placing the horizon across the centre of the frame or the main subject in the middle of it are classic rule-breakers that can work well, but that's all a bit mild – if you're going to break a rule you might as well do it with style!

Play with unusual camera angles. Tilt your camera so everything appears to be on a slant and sliding out of the picture. Jaunty angles can transform portraits and fashion shots, but they also work on close-ups, sport and action, architecture and most subjects. Another idea is to place important subject matter far away from the centre of the frame. When shooting portraits we tend to put people in the centre of a photo, but try moving your subject to the edge to see how it changes the dynamics of the composition.

Empty space is normally to be avoided, but it can be interesting and intriguing, especially if the main subject occupies only a small part of the frame, or is composed so that it breaks in from one side but the central area is empty.

The juxtaposition of elements in a scene can dictate the visual success of a photograph more than the actual subject matter. Experiment with objects or shapes to see how altering their arrangement transforms the look and feel. Try this: take a banana and an apple, place them on a white background and see how many different compositions you can come up with. For example, an apple sits nicely in the curve of a banana to achieve harmony. But if you place the apple against the curve of the banana, you create conflict.



The basics of exposure

Our jargon-free guide to the fundamentals of exposure provides all you need to know to get to grips with apertures and shutter speeds

EVERY EXPOSURE YOU take is made up of a combination of an aperture and shutter speed that determines how much light will reach the sensor. The aperture is the iris in the lens, much like the pupil of the eye, that can widen to allow more light through or contract to restrict the amount of light that enters the lens. Use a wide aperture and more light is able to pass through during a set time span than if you had selected a small aperture setting.

The shutter is a barrier in front of the sensor that moves out of the light's path when you press the shutter release, allowing light to reach the sensor and create an exposed image. The exposure's duration is determined by the shutter speed. There is an obvious relationship between the aperture and the shutter speed in

determining the correct exposure and this is selected by the exposure mode. While the full-auto AE (Auto Exposure) mode provides point-and-shoot simplicity by automatically selecting a combination of aperture and shutter speed, and allows beginners to take great pictures with the minimum of fuss, the beauty of digital photography is to take control and directly determine how the picture will look.

The first major step to doing this is to take your camera off full-auto and select one of the exposure modes that allow for far more creative photography. Follow our guide and experiment with apertures and shutter speeds – after all, it's not like you'll be wasting any film! Before you know it, you'll soon be creating imaginative images rather than just shooting snaps.

Exposure controls

Many beginners believe it's difficult to use aperture- or shutter-priority but, in fact, it's very easy to do. Once you've selected the exposure mode (1), it's simply a case of rotating the input dial (2) until the aperture or shutter speed you'd like to use appears on the top-plate (or rear) LCD panel (3). Depress the shutter button halfway and the camera works out the rest. It's as easy as that!



Exposure control

Take control of the exposure mode and determine how the final image will be captured. A small aperture and slow shutter speed means the entire scene is sharp and the water's motion is beautifully blurred.

■ UNDERSTANDING SHUTTER SPEEDS

Exposure settings are made by changing either the aperture or the shutter speed. The increments at which you change these settings are normally referred to as 'stops'. When you change a setting by a 'stop', you are either doubling or halving the exposure. So, for instance, changing from 1/500sec to 1/250sec doubles the duration of the exposure. As well as full stops, you can also vary exposure in 1/2 or 1/3 stops, depending on the camera model you use. The diagram below shows shutter speeds from one second to 1/4000sec.



Full stops	1sec	1/2sec	1/4sec	1/8sec	1/16sec	1/30sec	1/60sec	1/125sec	1/250sec	1/500sec	1/1000sec	1/2000sec	1/4000sec
Half stops	0.7sec	1/3sec	1/6sec	1/10sec	1/20sec	1/45sec	1/90sec	1/180sec	1/350sec	1/750sec	1/1500sec	1/3000sec	

■ UNDERSTANDING APERTURE SETTINGS

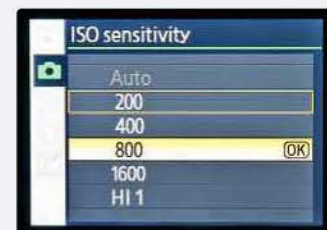
The illustration below shows the iris at one-stop increments, ie each step from left to right halves the amount of light passing through the lens. The maximum aperture setting refers to the iris wide open (in this instance f/2.8) and the minimum aperture is the iris at its smallest setting (f/32 in this case). An explanation of where the f/number derives from would require an extensive scientific explanation. The key to understanding apertures is to learn how f/numbers correlate with the size of the aperture.



Full stops	f/2.8	f/4	f/5.6	f/8	f/11	f/16	f/22	f/32
Half stops	f/3.5	f/4.5	f/6.7	f/9.5	f/13	f/19	f/27	

The ISO rating

It's worth mentioning the ISO rating. Basically, this indicates the sensor's sensitivity to light. A low setting, such as ISO 100, indicates less sensitivity, while a higher ISO setting, for instance 800, represents an increased sensitivity. We explain which ISO rating is best for certain situations on pages 30–31, but it's worth noting that the ISO you set determines the combination of apertures and shutter speeds available at particular light levels. If you're starting out, setting a low ISO rating (ISO 100–200) is best in bright conditions and a mid-setting (eg ISO 400) for general use.





Q&A: Exposure

Q What's a maximum and minimum aperture?

A These are the widest and smallest apertures that can be set on a lens.

Q Why are some zooms stated as having two maximum aperture values?

A Two figures are provided for the majority of zooms to indicate that the maximum aperture changes as you zoom the lens. For instance, an 18-55mm f/3.5-4.5 zoom indicates that the lens has a maximum aperture of f/3.5 when set to 18mm, and when it has zoomed into 55mm, it becomes f/4.5.

Q What are reciprocal exposure settings?

A There are a variety of combinations of shutter speeds and apertures that give the same exposure. For instance, 1/250sec at f/4 would give the same exposure as 1/500sec at f/2.8 or 1/125 at f/5.6. These combinations are



commonly known as reciprocal exposure settings.

Q What are fast lenses?

A A fast lens is one with a wider maximum aperture than the standard. For instance, a 70-200mm f/2.8 lens is described as fast because most

lenses of this type have a maximum aperture of f/4.

Q What is exposure compensation for?

A This facility allows you to adjust the set exposure, which we will cover in further detail later on in this guide.

Useful accessories

Make the most of exposure modes with the following accessories:

1) Tripod A basic tripod that provides a sturdy support for your heavy equipment will allow you to use longer shutter speeds without fear of camera shake ruining your images. Look to spend £40.

2) Neutral Density (ND) filter

An ND filter works by reducing the amount of light reaching the camera lens. Use one when you want to set long exposures but the light level is too high. Check out filters from brands such as Hoya, Lee and Cokin.

3) Remote release To avoid shake with long exposures, use a remote release to fire the shutter rather than physically pressing the shutter button. Your camera's instruction manual will tell you which you need for your specific model of camera. You can also help avoid shake by using the self-timer facility to delay the shutter firing.

Metering patterns

Understanding how your camera meters is a key part to making sure your images are perfectly exposed

EVERY TIME YOU press the shutter button, your camera's sophisticated TTL (Through The Lens) metering system measures the light in the scene and establishes what it thinks is the best exposure. How the camera measures the scene varies depending on the type of metering pattern selected, with multi-zone being the default choice. Knowing how this pattern and the other options work – along with exposure overrides that can be used when your metering system struggles – is essential to avoid badly exposed shots.

Your camera has at least three metering patterns, each designed with the same job of measuring light in the scene and calculating the correct exposure. Every pattern measures the amount of light in the scene in different ways, as explained opposite, but all follow the same basic principle, described below.

BASIC PRINCIPLE OF METERING

All metering systems work to a basic principle that the tones in a scene from the brightest highlights to the darkest shadows average out to a mid-tone of around 18% grey. In most situations this set-up works very well, but when scenes are far lighter or darker than average, there is a risk of poor exposures, which is when you'll need to turn to exposure overrides (see page 56).



Use a positive value with light subjects



Meter off mid-tones for perfect exposures.

How to select metering patterns

CHANGE METERING PATTERNS

Selecting a metering pattern is simple, with most cameras allowing different ways to access its metering mode options. You can use the MENU screen to reach the relevant tab, or go via a quick-access button, using the four-way control. Some cameras also have a dedicated metering mode button on the top-plate or rear for instant access, while others offer touchscreen simplicity! Our examples on the right cover Canon and Nikon models; other brands should follow a very similar procedure.



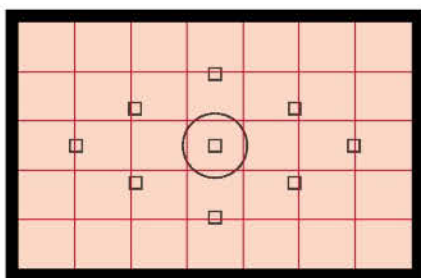
- 1) Press Menu, head to the relevant tab, press SET to choose option.
- 2) Press Q button, use four-way control to highlight metering mode, then turn input dial to change pattern.



- 1) Press Menu, select Shooting Menu, choose Metering, press OK and select a pattern.
- 2) If your camera has an i button, press it to access a menu of key functions. Select Metering and choose a pattern to use.

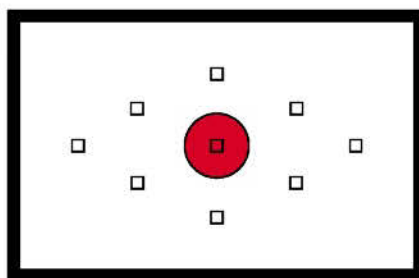


Spot-meter from a face if your subject is backlit.



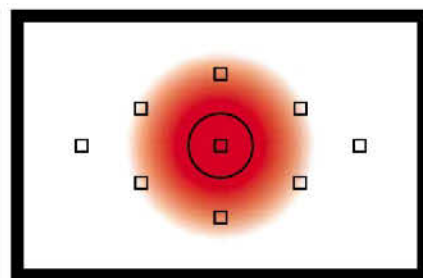
■ MULTI-ZONE

This is your camera's default setting and as it's so reliable, you'll find you rarely need to set another pattern. As its name suggests, this pattern works by dividing the image area into multiple zones or, in the case of some cameras, pixels. The camera takes a reading from each zone or pixel simultaneously, compares the findings with an image database in its memory made up of thousands of different scenarios, then establishes the exposure. The number of zones/pixels varies from camera to camera, with as few as 16 zones on some models to up to 91,000 pixels on others. All are accurate, with the latest versions proving incredibly reliable – in particular, those that link in with AF and White Balance systems, but none are 100% foolproof.



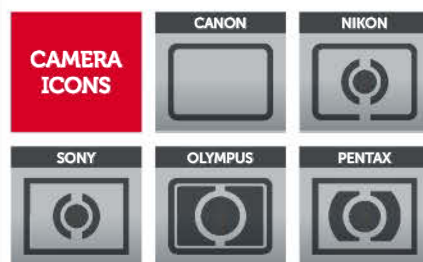
■ SPOT / PARTIAL

This is the metering pattern to select when shooting in difficult lighting situations as it allows you to take an exposure reading from a very small area at the centre of the frame. By positioning the metering area over a mid-tone in the scene, the exposure can be locked (using the AE-Lock function) and not be affected by areas outside of the spot/partial meter area. Spot metering is the most common and the most precise, with a measuring circle of around 3%. Partial is less common and has a larger measuring area of around 8% to 10% of the image frame, and works in the same way as spot. It's important when using this pattern to ensure the measuring circle takes a reading from a mid-tone, otherwise exposure error is possible.



■ CENTRE-WEIGHTED AVERAGE

This is the oldest and least precise metering pattern, taking an average reading from the whole image frame but with some emphasis towards the central area. It's a pattern that most will rarely use for everyday shooting situations, but is an option to use when using the AE-Lock facility.



Did you know?

An increasing number of cameras now link the AF, White Balance and metering systems for improved performance. Canon's iFCL and Nikon's Scene Recognition System are just two examples.

Exposure overrides

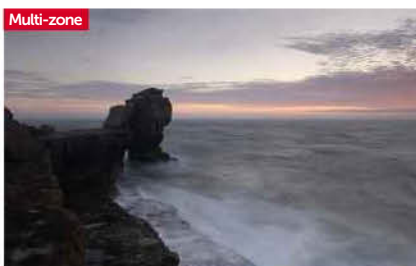
We cover the best facilities to ensure you can correctly expose scenes that your camera struggles with

1) AE-Lock

This function lets you choose where in the scene to take the exposure measurement. For the most accurate results, use AE-Lock with spot metering rather than multi-zone, as you can then take an exposure meter reading from a small area of mid-tone. The AE-Lock works independently of the focus, so you can take an exposure reading from one area of the frame and focus on a different part of the scene.

With some Canon EOS DSLRs, pressing the * button takes an AE-Lock reading that automatically uses the partial meter, so there is no need to switch over from the multi-zone metering system.

The advantage of using AE-Lock is that for scenes that have high contrast (in other words, that have very bright and very dark areas), there is a risk of the camera producing a poor exposure, so using the AE-Lock facility helps ensure a correct exposure. We'd recommend using AE-Lock in certain conditions. When the subject is strongly backlit, the bright sky can lead to underexposure, so use AE-Lock to take a spot-meter reading off a mid-tone (for instance, Caucasian skin or brickwork). Use the same technique if the subject is placed against a dark background. When shooting landscapes with much of the frame filled with sky, take an AE-Lock reading off grass or rocks. It's also a useful function when shooting panoramas as you can lock the exposure for all the frames that will later be stitched together.



Multi-zone
Landscapes with lots of sky and sea can often cause a multi-zone meter to underexpose.



AE-Lock off light area
Use the AE-Lock to spot-meter from a bright area and you'll underexpose the scene.



Where to find AE-Lock on your camera: Most models have the AE-Lock button positioned on the top-right corner of the camera's rear, within easy reach of the right thumb. Check your camera's manual if you're unsure where to find it.



AE-Lock off dark area
Use the AE-Lock to spot-meter from a dark area and you'll cause the scene to overexpose.



AE-Lock off mid-tone
Use the AE-Lock to spot-meter from a mid-tone (the rocks) for the correct exposure.

Custom Functions and AE-Lock: Many cameras allow you to adjust how AE-Lock works via Custom Functions. The most common options are to have the exposure locked only as long as you hold down the AE-Lock button, or to link the autofocus with the AE-Lock button. Your camera's manual should provide details.

IMAGES: ROSS HODDINOTT

2) Exposure compensation

This is the fastest, easiest and most popular exposure override facility and allows you to make quick adjustments to add or subtract from the camera's indicated exposure. Using exposure compensation, you can apply positive (+) compensation to increase the exposure or negative (-) to decrease it. A scale on the LCD monitor/viewfinder allows you to see exactly how much compensation you're applying. With all cameras, the compensation stays set, so be sure to return it to the central '0' marker.

How the camera applies compensation depends on the mode you use. In aperture-priority, the shutter speed is changed, while the opposite is true in shutter-priority.

In program, the lighting level is taken into consideration with the camera prioritising the avoidance of shake. It is set in 1/3 or 1/2-stop increments, with most models offering you a Custom Function that allows you to choose one or the other.

You can use exposure compensation with any metering pattern and with



experience you should be able to judge when it's needed and how much compensation to apply. For instance, any old hand will add around 1.5 stops when shooting backlit subjects or snow scenes without a second's thought and you'll soon develop these sorts of skills, too. If you use LiveView, you'll find using exposure compensation to be the fastest and simplest way to correct exposure error.



Exposure compensation and flash: How compensation is applied to flash exposures varies on the brand of camera you use. Some, like Canon, will only adjust the ambient exposure and leave the flash unaltered, whereas Nikon users will find both ambient and flash exposures are changed with Nikon. A handy reference table for most brands is on page 153.

IMAGES: LEE FROST

3) Auto Exposure Bracketing (AEB)

■ AEB

Auto Exposure Bracketing allows you to shoot a series of images with incremental changes in the exposure. Its primary aim is for inexperienced photographers to increase the chance of getting a correct exposure by shooting a set of three (or five) images with slightly different exposures. You set the increments much like exposure compensation, at 1/3, 1/2 or one-stop intervals, and the camera fires a sequence based on the indicated exposure, plus over and underexposed.

While Auto Exposure Bracketing has never been a regularly used function, its use has become increasingly popular amongst photographers when shooting a sequence of images to combine for creating HDR results.



The second image was captured using the camera's indicated exposure and shows slight underexposure.



This is the first image from an AEB sequence of +/-1 stop. As you can see, it's grossly underexposed.



The final image from the bracket has been given one stop extra exposure and provides a decent result.

■ AEB WITH EXPOSURE COMPENSATION

Experienced photographers combine AEB with exposure compensation to allow them to bias the bracketed set of exposures to their needs. For instance, when shooting a snow scene, there's a requirement to apply positive compensation to avoid the scene appearing too dark. Using AEB in its standard fashion, by setting +/-1EV, you'd have a set of three images made up of the standard exposure, plus one that is one-stop underexposed and one that's one-stop overexposed. Of this set of three, it's likely the under and standard exposures will both be worthless, while the overexposed image may still not have enough exposure. A way around this is to set the exposure compensation to +1EV, so that, in effect, the middle exposure is in fact receiving +1EV, the -1 bracket is receiving the standard exposure, while the +1 bracket is in fact two stops overexposed. This provides a better chance of the bracket having a decent exposure than using AEB alone.



The camera's metering grossly underexposes this scene.



Exposure compensation of +1EV is cancelled out by the AEB at -1EV.



+1 exposure compensation and AEB at 0EV gives better results.



EC and AEB combine to add two extra stops, giving the best result.

An introduction to apertures

They're an important part of picture-taking and essential to understand if you want to take good shots, so let's get to grips with apertures

THE MOST IMPORTANT technical aspect of photography is creating a well-exposed image. Okay, focusing is important, too – there's no point producing perfectly exposed shots if they're out of focus – though autofocus systems can take care of that for you. The same can be said of exposure, too, to an extent. You can set your DSLR to program or full-auto mode and, more often than not, it'll get the exposure spot on without you having to think about the settings being used. However, the two main controls that make that exposure happen – the lens aperture and the shutter speed – also perform other important tasks that have a big influence on the success of every photo you take, so understanding what they do and how they do it is crucial.

The main role of the lens aperture is to control the flow of light through the lens, which it does using a series of f/numbers (see below). But there's more, because those f/numbers also control how much of the scene or subject you're shooting will record in focus.

This 'zone' of sharp focus is commonly referred to as depth-of-field. The wider the aperture is (the lower the f/number), the less depth-of-field you get, and the smaller the

aperture (the higher the f/number), the more depth-of-field you get. So, if you're shooting portraits, for example, you're more likely to use a wide aperture to reduce depth-of-field and throw the background out of focus, while for landscapes, it's common to use a smaller aperture to give increased depth-of-field, so everything is recorded in focus.

We'll cover these areas in more detail later, but suffice to say that because depth-of-field varies so much across the aperture range, knowing which aperture is set and the effect it's likely to have on the final image is crucial, and that task is down to you.

Any of you dabble with electronic flash? Then aperture choice again takes priority because it also controls the flash exposure. The reason is that the duration of a burst of flash is so brief that the camera's shutter speed becomes irrelevant – providing it's not faster than the flash sync speed of the camera. Achieving an accurate exposure is based solely on how much of that flash burst is allowed to enter the lens, which, in turn, is dictated by the size of the lens aperture – if the aperture is too big you'll get overexposure; too small and the image will be underexposed.

APERTURE BASICS

The aperture, which is an iris formed by a series of blades in your lens, closes down to form a hole through which light passes. The size of that hole is governed by a series of f/numbers, something like this: f/1.4, f/2, f/2.8, f/4, f/5.6, f/8, f/11, f/16, f/22, f/32.

As the f/number gets bigger, the aperture itself gets smaller, and vice versa. More precisely, each aperture in the sequence admits half as much light as the previous one moving down the scale from left to right, and twice as much as the previous one moving right to left. The range of f/numbers offered by a lens varies – a 50mm prime lens may go from f/1.4 to f/16, whereas a 70–200mm telezoom may have a range from f/4 to f/32. It's the maximum (lowest) and minimum (highest) f/numbers that differ from lens to lens, but the core range can be found in all modern lenses.

As the aperture is set electronically in DSLRs, there are also intermediate f/numbers between the main f/stops, usually in third-of-a-stop increments: between f/4 and f/5.6, for example, you can set f/4.5 and f/5; between f/5.6 and f/8, there's f/6.3 and f/7.1; and so on. This gives you more precise control over the exposure.

The way you set the aperture depends on the exposure mode your DSLR is set to. Of all the exposure modes on offer, aperture-priority is the most useful. This is where you control the aperture; it allows you to choose the aperture, and if light levels fluctuate – which means the exposure has to be adjusted – the camera does that by changing the shutter speed. The same applies if you dial in exposure compensation. In shutter-priority, the opposite happens; the shutter speed remains fixed and the camera changes the aperture, which is not what you want. Manual mode works well, too, because



Above: Selecting a wide aperture. A larger aperture (ie lower f/number) results in a shot with a shallow depth-of-field, meaning the surrounding area falls softly out of focus.

Above right: Using a small aperture. A smaller aperture (ie higher f/number) results in a shot with sharper details. The smaller the aperture setting, the more front-to-back sharpness you're likely to achieve.



ROSS HODDINOTT



both the aperture and shutter speed remain fixed until you physically change them, but it's a slower mode to use and it's easier to mess up the exposure in changing light.

Jargon buster

- **Diaphragm:** The series of blades that close down to form different-sized apertures according to the f/number set. This is also sometimes referred to as the iris.
- **F/stop:** The numbers used to denote aperture size. You'll recognise them as f/2.8, f/4, f/5.6, f/8, for instance.
- **Open up:** To select a wider aperture (lower f/number) – for example, going from f/11 to f/8 or f/5.6.
- **Optimum aperture:** The aperture at which a lens gives its best optical performance. This is usually f/8 or f/11.
- **Stop down:** To select a smaller aperture (higher f/number) – for example, going from f/8 to f/11 or f/16. This term is also used to refer to setting your lens to its smallest aperture (biggest f/number).
- **Small aperture:** An aperture with a high f/number, such as f/16 or f/22.
- **Shallow/narrow depth-of-field:** This is when only a small part of the scene or subject is recorded in focus, achieved by setting a wide aperture (low f/number). The wider the aperture, the shallower the depth-of-field.
- **Wide aperture:** An aperture with a low f/number, such as f/2.8 or f/4.
- **Wide open:** Setting your lens to its widest (maximum) aperture; ie the one with the lowest f/number.

Exposure modes

Av **Aperture-priority (A or Av):** As the name implies, it's intended to give you full control over the aperture that is set – you change the f/number by turning a dial until the one you want is displayed. The shutter speed automatically changes to match the aperture so that correct exposure is maintained.

Tv **Shutter-priority (S or Tv):** If you're shooting in shutter-priority mode then you select the shutter speed you want and the camera matches it with the aperture required to achieve correct exposure. All you do, therefore, is adjust the shutter speed until the camera sets the aperture you want.

P **Program mode (P):** The camera sets the aperture and shutter speed automatically, but you can shift the combination using the input dial until the aperture you want is displayed.

M **Manual mode (M):** You set both the shutter speed and aperture, so select the aperture you want then adjust the shutter speed until correct exposure is indicated.

Front to back

You need to set a small aperture to get shots like this, where everything is recorded in focus.

LEE FROST

**Depth-of-field preview**

Assessing depth-of-field – how much of a scene will be recorded in focus – is tricky with DSLRs. That's because the aperture in lenses is set to its lowest f/number (widest aperture) until you press the shutter; so the depth-of-field you see in the viewfinder is what you'd get if you took the shot with the lens wide open. To get an idea of the depth-of-field you'll achieve at the aperture you're going to use for the shot, you can use your DSLR's depth-of-field preview – there's usually a button on the front of the camera. Press it to manually stop the aperture down to the f/number set. If you select a small aperture, the viewfinder will go dark when you depress the preview button, because you're letting much less light in through a smaller hole. Initially you'll find it difficult to see much at all, but if you keep your eye to the viewfinder, it will adjust to the lower light levels and you'll begin to see the image more clearly – enough to establish what's in focus. If you're a Canon user, you have the advantage of assessing depth-of-field using LiveView on the bright LCD monitor.

**Aperture FAQs****Q What's the connection between aperture and lens speed?**

A Lens speed refers to the maximum (widest) aperture a lens has. For example, some 70–200mm telezooms have a maximum aperture of f/2.8, while others only go as wide as f/4. Where a lens in any category has a wider maximum aperture than most, it's said to be a 'fast' lens; so a 70–200mm f/2.8 would be classed as fast, as would a 16–35mm f/2.8 or an 85mm f/1.4, and so on, whereas a 75–300mm f/4–5.6 zoom would be considered 'slow'. Fast lenses are more expensive and usually bigger/heavier than their slower stablemates because their optical design is more complicated.

Q What's the benefit of a fast lens over a slower one?

A The immediate benefit is that by being able to set a wider maximum aperture, you can use a faster shutter speed – that's why sports and wildlife photographers favour them. You might be limited to 1/125sec with a lens wide open at f/4, but in the same situation with a lens that has a maximum aperture of f/2.8, you could shoot at 1/250sec. That's because going one stop wider lets twice as much light through and the shutter only needs to be open for half as long. Another benefit, especially with telephoto and telezoom lenses, is that you can achieve a shallower depth-of-field with a wider maximum aperture to isolate your subject and throw the background out of focus. You also get a brighter viewfinder image aiding composition and focusing, especially in low light.

Q Are f/numbers the same from lens to lens – for instance, is f/8 on a 70–200mm zoom the same as f/8 on a 17–40mm zoom?

A Yes, all f/numbers admit the same amount of light, regardless of the lens focal length, so if you switch from one lens to another in any situation, the shutter speed you need to achieve correct exposure is the same if the aperture on each lens is the same.

Q Why does the maximum aperture on some zooms vary, such as with a 75–300mm f/4–5.6?

A Zoom lenses use a number of glass elements in various groups or clusters to achieve a variable focal length. As you zoom through the focal length range from the wider end to the longer end, those elements move to magnify the subject. In less expensive zooms, the optical design is such that the effective maximum aperture becomes smaller as focal length increases in order to keep the cost of the lens down. Zooms that have a constant maximum aperture through the focal length range are more costly because they incorporate a more complicated optical design.

Q Why is it that if I take a photograph that suffers from flare, the flare spots are often a similar shape to the lens aperture?

A Because flare is caused by non-image forming light bouncing around inside the lens, sometimes some of it reflects off the diaphragm that forms the aperture, hence why you get aperture-shaped flare! It can look effective on some shots, but is generally best avoided by using a lens hood or shading the front of the lens so it's protected from stray light.

The wonders of wide apertures

For maximum creativity with your camera, learn how using wide apertures can transform your images

AS WE'VE ALREADY explained, the lower the f/number, the 'wider' the aperture. An immediate consequence of setting a wide aperture is that more light floods into your lens, which in turn means that the shutter inside your camera doesn't have to stay open for as long to achieve the correct exposure. In other words, the wider the aperture, the faster the shutter speed in any given situation.

Sports photographers often shoot with their lenses set to wide apertures because it allows them to keep the shutter speed nice and high to freeze fast-moving subjects – to stop a Formula 1 car in its tracks, you need to be on 1/1000sec or faster. On a more practical level, 'opening up' your lens aperture to maintain a decent shutter speed will help you to avoid camera shake when handholding. This is especially useful when using a telezoom or telephoto lens, which increases the risk of shake; not only because

such lenses can be big and heavy, but they magnify any camera movement.

Wide apertures really come into their own in low light when you're pushing the limits of possibility. It's not always practical to use a tripod to keep the camera steady, so you'll have no choice but to set your lens to its widest aperture and handhold. The type of lens you have can make a big difference here – a 50mm prime lens is a brilliant low-light lens because, as well as being compact and lightweight compared to zooms, which makes it easier to handhold, even the 'slowest' ones have a maximum aperture of f/1.8, so you can get away with surprisingly high shutter speeds in relatively low light. You can get 'faster' 50mm lenses with a maximum aperture of f/1.4 or even f/1.2, though the latter option is not only about ten times more expensive than an f/1.8, it's also about ten times heavier, so any benefits you get from

the faster maximum aperture are lost by the size and weight of the lens as you'll require a faster shutter speed to avoid camera shake!

Shutter speeds aside, the other major benefit of shooting at wide apertures is that you get reduced depth-of-field, so less of the subject or scene is recorded in focus. The wider the aperture is, the less depth-of-field you get with any lens, so f/4 will give you less depth-of-field than f/5.6 or f/8. Depth-of-field reduces even further as focal length increases, for any given aperture, so if you take a shot at 28mm and f/4, more of the scene will be in focus than if you shoot at 200mm and f/4.

Finally, for any focal length or aperture, depth-of-field is reduced as the subject gets closer to the camera – down to literally a few millimetres with a macro lens used wide open and at minimum focusing distance. This effect can produce fantastic images when used creatively.



ROSS HODDINOTT

■ WIDE APERTURES FOR LANDSCAPES

The concept of using a wide aperture when shooting landscapes may seem alien, because usually you want to record a scene in focus from front to back and a wide aperture is unlikely to do that. Or is it? Actually, in some situations it will. You only need lots of depth-of-field when the nearest point in the scene is close to the camera. But sometimes you'll find that everything you're including in a shot is far away – at infinity – which means you don't need any depth-of-field at all. Taking aerial shots from a plane or hot-air balloon is a good example – you can shoot with your lens wide open, which you may need to do to keep the shutter speed high enough to counteract the fact that you're moving and still record everything in focus. The same applies if you're on a hill or mountain and shooting the valley below, or capturing the urban landscape from a high viewpoint, such as the top of a skyscraper.

Shallow depth-of-field can also work well in landscape photography, allowing you to record one element in focus while everything else fades to a blur – such as a lone tree in the middle of a field, captured using a telezoom at its widest aperture. This technique is known as differential focusing. You can also get striking results by using a wide-angle lens wide open and focusing on something close to the camera, such as a leaf on a rock or a single flower, so it's sharp, but everything else is out of focus. If you use your lens wide open, the scene will record exactly how it looks through the viewfinder, so it's easy to assess the (lack of) depth-of-field and also be sure you've focused on the right spot.

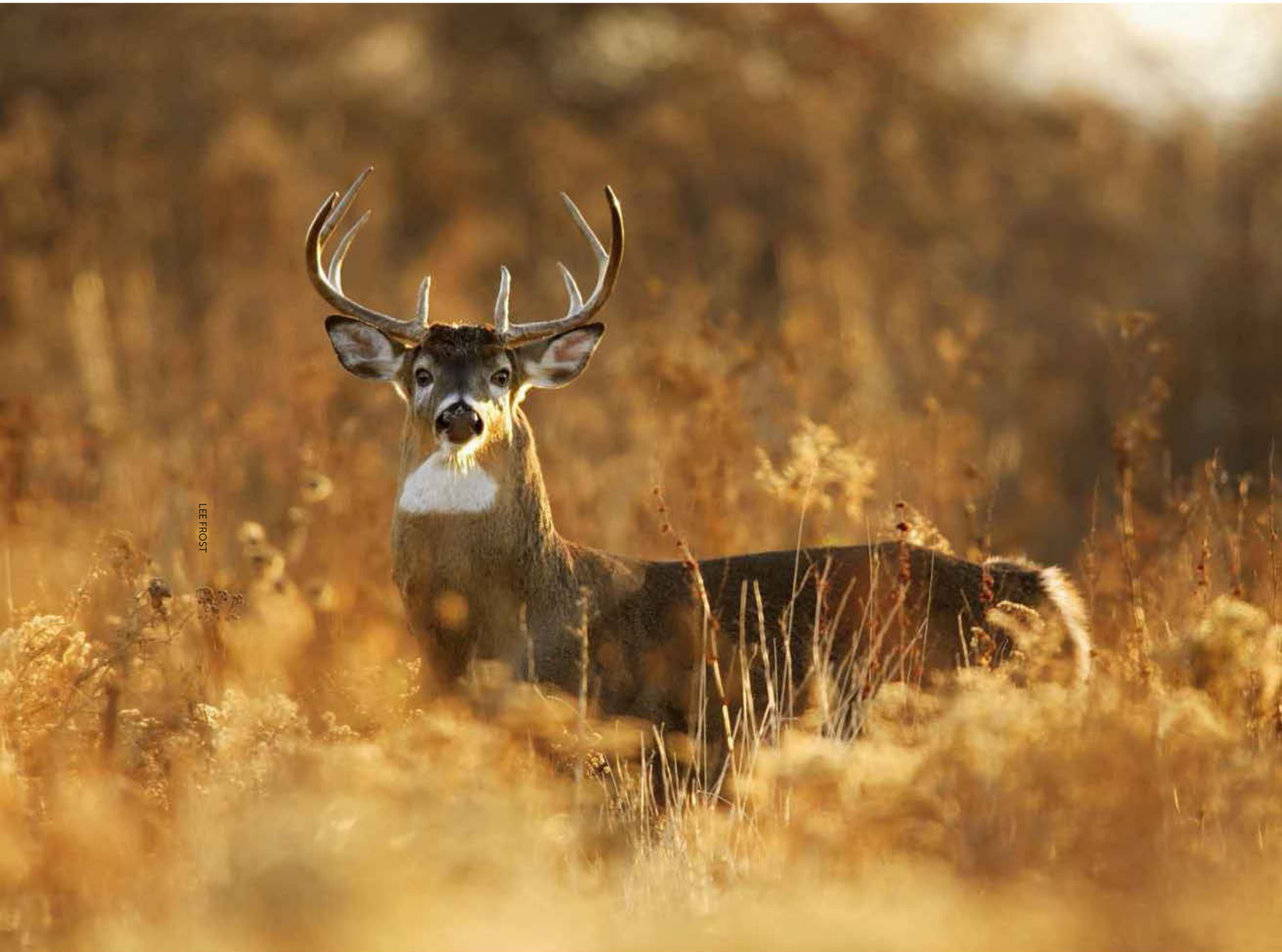


ISTOCK PHOTO

■ WIDE APERTURES FOR PORTRAITS

Portraiture and wide apertures were made for each other, simply because you'll often want to throw whatever's behind your subject out of focus so it doesn't take attention away from their face. Short telephoto lenses in the 85mm to 135mm range are said to be the best choice for traditional portraiture because they compress perspective a little and this flatters facial features, but they also give shallow depth-of-field at wide apertures so you can throw the background out of focus. If you want to do that but also record all of your subject's face in focus, stick to an aperture of f/5.6 and focus on your subject's eyes. If you use a wider aperture, depth-of-field will be reduced to the point where parts of your subject's face may not be sharply focused – such as the tip of their nose and their forehead. This effect can work well, though, as it focuses attention on your subject's eyes – especially if you shoot with your lens at maximum aperture. Try shooting portraits with a telezoom at f/2.8 or f/4, or a 50mm prime lens at f/1.8. If you do, though, make sure your subject is square on to the camera so that when you focus on one eye, the other one is also sharp. Alternatively, shoot from an angle so one eye is closer to the camera than the other and focus on the nearest eye.

ISTOCK PHOTO



LEE FROST

■ WIDE APERTURES FOR NATURE

Nature photography usually involves capturing timid subjects that are some distance from the camera, relatively small and, in many cases, well camouflaged in their natural habitat. This makes long telephoto lenses the best tool for the job, so you can shoot from a safe distance but also get your subject a decent size in the frame – focal lengths of 300mm to 600mm are common. Wide apertures are also favoured over small ones, partly to keep the shutter speed high so camera shake is avoided (long lenses are heavy) and subject movement frozen, but also to isolate the subject so it stands out from its background. Unless you can afford to shell out thousands on fast prime telephoto lenses (300mm f/2.8; 500mm f/4; etc), the maximum aperture of your longest lens or zoom is likely to be a rather modest f/5.6 or f/8, especially if you use a teleconverter to boost focal length. However, don't worry, because once focal length gets to 300mm or beyond, depth-of-field will be really shallow even at these apertures, and if you focus carefully on your subject, the background will be reduced to a fuzzy blur.

Shorter telephoto focal lengths up to 200mm can also be really effective when used wide open on subjects that are closer to the camera to concentrate attention on one area, such as an eye, and let everything else blur away. The same applies when shooting wildlife from close quarters with a wide-angle lens – even though wide lenses generally give lots of depth-of-field, if the focusing distance is small and you shoot at maximum aperture, it's surprising how shallow the depth-of-field will be, rendering your main subject sharp, but blurring out the background.

Wide apertures: Focusing

Shallow depth-of-field has many applications in creative photography, but one thing you do need to be aware of is that as the zone of focus in an image is reduced, the need for accurate focusing increases because there's less room for error. This applies more with telephoto lenses than wide-angles because depth-of-field can literally be down to a few inches when shooting with a tele lens wide open, so you need to be sure that you've focused on exactly the right spot.

Modern AF systems can help a lot here, but they're not foolproof – they will only focus on whatever's behind an active AF point. Practice is the key; getting used to your camera's focusing system, learning how to switch AF points with the camera to your eye so you can keep an off-centre subject sharp or focus on a specific point once the shot has been composed, using focus 'assist' points to help keep a moving subject sharp, and so on. Alternatively, when all else fails, you can switch to manual focus and rely on your eyes rather than modern technology! This may seem rather radical given that autofocus is so good, but sometimes low-tech is best!



ROSS HODDINOTT

Aperture and close-ups

Your point of focus can make a good close-up shot brilliant. Here are the pros' secrets to achieving amazing macro results...

AS YOU'VE ALREADY discovered, the larger the aperture, the narrower depth-of-field becomes. However, this effect is exaggerated further when shooting close-ups, as it also grows progressively shallower at higher magnifications. The zone of sharpness can be wafer-thin at reproduction ratios in the region of 1:1 (life-size), so in order to capture pin-sharp close-ups using wide f/stops, your focusing and technique must be good.

With depth-of-field being so limited at large (wide) apertures, you might assume that a smaller f/number would be better to generate a larger zone of sharpness. Doing so, though, will normally bring distracting foreground and background detail into focus, creating messy backdrops that draw the eye away from your subject. Selecting a smaller aperture will also result in a much slower corresponding shutter speed, which can be impractical when working handheld or if photographing moving subjects, like insects or flowers that are windblown.

Practical considerations aside, there are also many aesthetic advantages to employing a large aperture when shooting close-ups. It will help you throw the subject's surroundings beautifully out of focus, creating a diffused wash of colour that will help your subject stand out boldly – a technique we mentioned earlier, known as differential focusing. For example, when photographing insects or wild flowers, an aperture in the region of f/4 or f/5.6 will ensure only the subject itself is sharp and that the background is clutter-free without the need to 'garden' surrounding vegetation or alter viewpoint. In order to maximise the available depth-of-field at any given f/stop, try to keep your camera's sensor plane parallel to the subject. This is because there is only one geometrical plane of complete sharpness, so

you want to place as much of your subject within this plane as possible.

Whether you're photographing wildlife, plant life or still-lives, selecting a large aperture can prove a highly useful creative tool when using a macro lens or close-up attachment, emphasising your point of focus. Virtually everything in front of and behind your point of focus will drift progressively out of focus, offering all kinds of creative potential. For example, you may want to place your point of focus on a flower's petals or stamens while allowing the rest of the flower to drift attractively out of focus. The trick is to achieve just enough depth-of-field to ensure your background subject is nicely diffused but remains recognisable. If your camera has a preview button, use it to view the effect. Adjust the f/number if more or less depth-of-field is required. This type of selective focusing can create striking, artistic results and convey far more about the subject's size, beauty and design than had it been captured sharp.

A large aperture allows close-up photographers to be far more creative with focusing, but it's not all good news. The shallow depth-of-field created by using a wide aperture means focusing has to be pinpoint accurate. With the zone of sharpness potentially just a matter of millimetres, achieving sharp results handheld isn't easy. Whenever possible, use a tripod. This will allow you to place your point of focus with far greater accuracy. In situations where using a tripod isn't practical, take a larger sequence of shots to ensure at least one is correctly focused. Manual focus is best as autofocus can struggle to lock on to close-up subjects. Better still, use your camera's LiveView and zoom into the area you wish to focus on before carefully fine-tuning your focus accordingly.

Pro tip: Ross Hoddinott

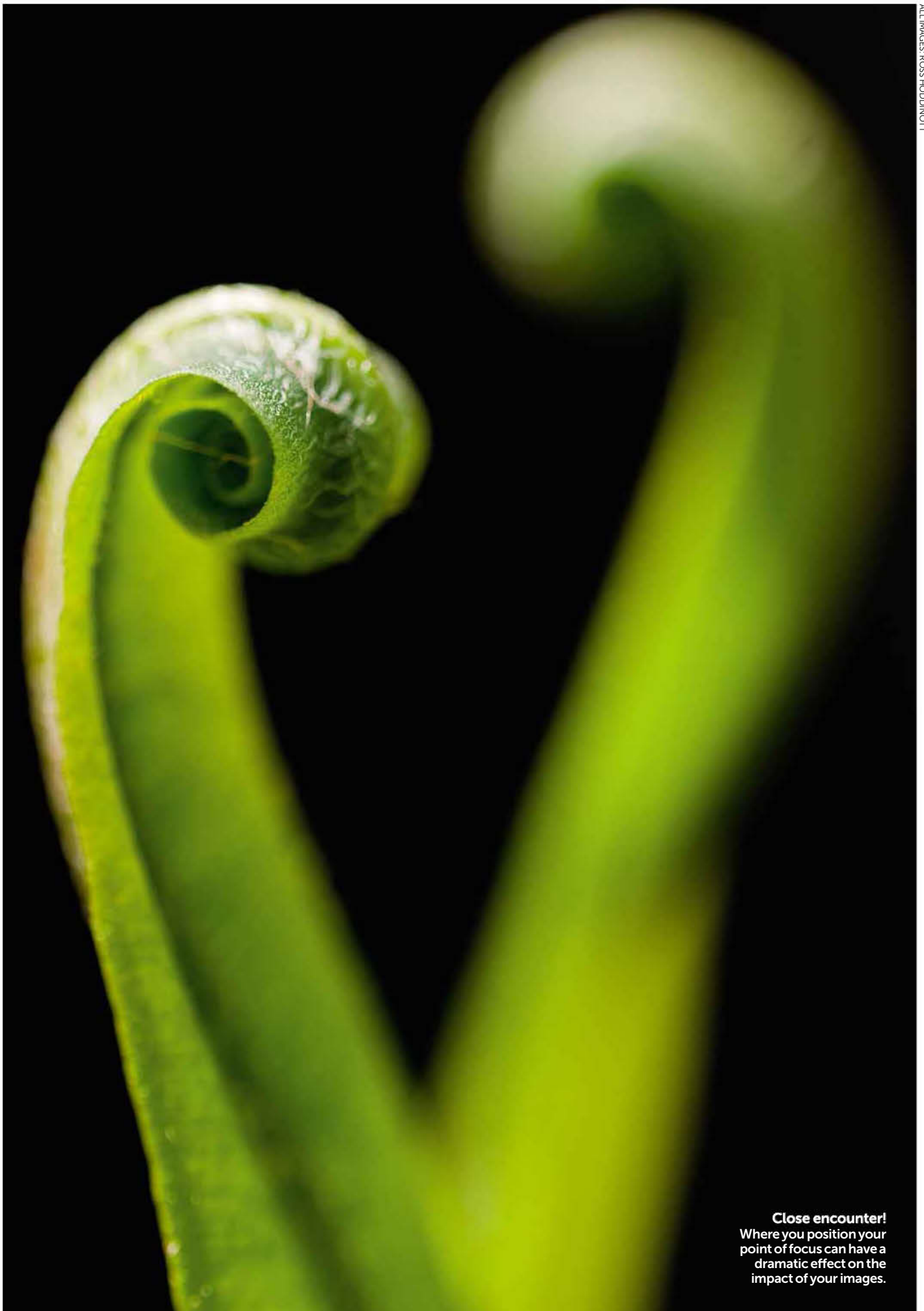
"When shooting close-ups, depth-of-field is often very shallow due to the high level of magnification. As a result, the general perception is that a small aperture should be used. I disagree, though; I rarely employ small apertures when shooting wild flowers and insects. First, a small aperture results in a slower shutter speed, which is often undesirable when shooting wildlife in natural light. Second, doing so can bring too much distracting background detail into focus, creating messy backdrops. I often use larger apertures in the region of f/2.8 to f/8. Such a narrow depth-of-field helps my subject stand out boldly against its backdrop. Results can look striking, but focusing does have to be pinpoint accurate. To ensure you keep the subject acceptably sharp throughout, position your camera parallel to the subject to maximise depth-of-field. Also, if possible, focus manually using LiveView to allow you to zoom in and place your point of focus precisely. A shallow depth-of-field can certainly prove a powerful aesthetic tool for close-ups."



■ ALTERING DEPTH-OF-FIELD

Anyone can capture a sharp image, it is where you put the blur that really matters! This picture sequence of a banded damselfly was taken using the same viewpoint and point of focus – only the level of depth-of-field has been altered. The sequence here shows how background detail becomes more noticeable and distracting in the images taken using a smaller aperture. A wide aperture will help you isolate your subject, emphasising its shape and form, but position your point of focus with great care.





Close encounter!
Where you position your point of focus can have a dramatic effect on the impact of your images.

Make the most of small apertures

Whatever lens you use, knowing the right aperture to set for specific subjects will aid your picture-taking skills no end. Here's a quick guide

THE MAIN REASON why photographers stop their lenses down to small apertures is to increase depth-of-field so more of the scene is in focus. That said, you need to be aware that depth-of-field is also affected by two other factors – lens focal length and focusing distance. The wider a lens is (smaller the focal length), the more depth-of-field you get at any given aperture and the more telephoto the lens is (the longer the focal length), the less depth-of-field you get at any given aperture. In terms of focusing distance, at any given focal length and aperture, depth-of-field increases as the focusing distance gets further away from the camera.

With ultra wide-angle focal lengths in the 10-15mm range (15-22mm on full-frame), if you stop down to f/16 or f/22, you can record everything in sharp focus from just inches away to infinity as depth-of-field is so extensive. That said, you need to focus on a specific distance – the hyperfocal distance – to maximise depth-of-field (see page 68). Telephotos give much less depth-of-field at small apertures than wide-angles, but as you tend to be shooting more distant scenes or subjects due to the magnifying power of the lens, this isn't usually a problem.

Because small apertures reduce the amount of light entering the lens, slower shutter speeds must be used to maintain correct exposure – ie if you take a meter reading and get an exposure of 1/60sec at f/4,

as you stop the lens down, the shutter speed will change (see chart below). You need to remember this when handholding, especially in low light, as your shots could suffer from camera shake. The rule of thumb is to make sure the shutter speed at least matches the focal length you're shooting at: 1/60sec for 50mm; 1/125sec for 100mm to 135mm; 1/250sec for 200mm; and so on. That said, some photographers have steadier hands than others, so you may find that you don't need to adhere to this rule. Many lenses also have image stabilisation, which counteracts the effects of camera shake and allows you to handhold at slower shutter speeds but still get pin-sharp results – you may find you can get shake-free shots on 1/30sec with an image-stabilised 70-200mm zoom at 200mm. Increasing the ISO will allow you to use a faster shutter speed, but where possible, mount your camera on a sturdy tripod.

A positive aspect of stopping the lens down and using slow shutter speeds is that you can capture motion. Waterfalls look far more atmospheric when they're shot using an exposure of 1/2sec to one second, so the water records as a milky blur, while lapping waves can be turned to mist with an exposure of 30 seconds or more. Blowing grass, swaying trees, crowds of commuters, galloping horses – you can use slow shutter speeds and stop your lens right down to creatively record motion in all kinds of subjects.

Pro tip: Lee Frost

"A downside to shooting with very small apertures is that diffraction occurs – ie the wavelengths of light are bent or diffracted as they pass through the hole in the lens created by the aperture blades, resulting in a loss of sharpness. Some lenses suffer less than others, but ultra wide-angles tend to be affected more than telephotos, and zooms are affected more than prime lenses. Diffraction is worse at small apertures because it's the edges of the aperture blades that cause light to diffract; the smaller the aperture is, the greater the proportion of the total light wavelengths being diffracted. At wide apertures, diffraction is much less because the proportion of diffracted light compared to non-diffracted light is smaller. If a lens suffers badly from diffraction, any benefits in terms of depth-of-field will be cancelled out by the loss of sharpness. The solution? Don't stop your lens down any further than you have to."



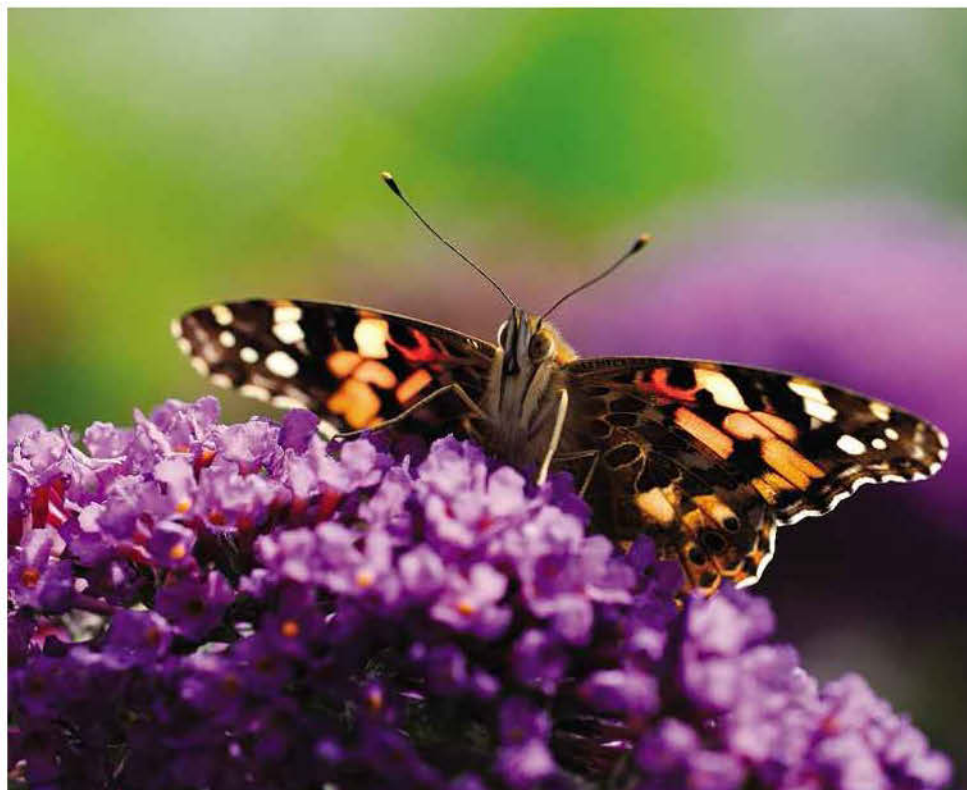
LEE FROST

Shutter	1/125sec	1/60sec	1/30sec	1/15sec	1/8sec	1/4sec	1/2sec	1 second
Aperture	f/2.8	f/4	f/5.6	f/8	f/11	f/16	f/22	f/32

■ SMALL APERTURES IN NATURE

As with portraits, nature images can also be shot in an environmental way. Instead of using a long lens and wide aperture to isolate the subject from its surroundings, why not practise the opposite and show an insect or animal as part of its surrounding natural habitat? Often you'll still need a telephoto lens to do that, simply because you'll need to remain at a safe distance to avoid spooking your subject and frightening it away. Instead of filling the frame, pull back on your zoom to get more of the surroundings in the composition, and stop down to f/11 or f/16 to record everything in focus.

Where you can get close to your subject, switch to a wide-angle lens for a more dramatic perspective. This technique is often used for shots of reptiles, insects and butterflies, or tamer birds that don't fly away when you approach them. If you focus on your subject with the lens set to f/11 or f/16, everything in the shot will be sharply focused. Nature photographer Frans Lanting often uses wide-angle lenses for wildlife shots and the results are amazing – check out his work for inspiration. Visit franslanting.photoshelter.com.



ROSS HODDINOTT



■ SMALL APERTURES FOR LANDSCAPES

Just as wide apertures and portraits go hand in hand, so do landscapes and small apertures. Most landscape images are shot with wide-angle lenses to capture a broad view. More often than not, we want to record everything in focus; the easiest way to do that is by stopping the lens down to $f/16$ or $f/22$ to maximise depth-of-field. Fortunately, wide-angle lenses give extensive depth-of-field at small apertures and it increases as focal length decreases. It's just as well, because the wider the lens is, the closer we tend to get to foreground interest to fill the frame and give the composition impact and the more depth-of-field you need. If shooting urban scenes at night, stopping your lens down will allow long exposures to capture light trails, while bright points of light tend to record as stars. There are downsides to stopping your lens right down to minimum aperture (see panel opposite), so avoid it wherever possible and stay a stop or two away from the minimum aperture. One way to do this and still get enough depth-of-field is by using hyperfocal focusing (page 100).



LEE FROST

ISTOCKPHOTO

■ SMALL APERTURES FOR PORTRAITS

Although we generally shoot portraits using telephoto lenses and wide apertures, no law says we have to. How about environmental portraits that depict your subject in their environment: a gardener in their potting shed; a potter at their wheel; a cook in their kitchen? These types of portrait are often more successful than traditional headshots because they tell us so much more about the subject and are photographically more interesting. Most environmental portraits are shot using a wide-angle lens, so you can include lots in the frame while still being fairly close to your subject. They also lend themselves to being shot with a small lens aperture so that you can record everything in focus.

Another style for environmental portraits is to use a wide-angle lens at close range, so that you don't get much more than your subject's head and shoulders in the frame. The exaggeration of perspective means you can still include the background as their environment and shoot at a small aperture to record everything in focus – because the background stretches into the distance, your subject still dominates the frame.



ISTOCKPHOTO

Understanding shutter speeds

Creating movement or freezing images is a skill related to shutter speeds. Learn how to control them for every situation...

THE TYPICAL SHUTTER speed range in a DSLR is from 1/4000sec down to 30 seconds, plus a Bulb setting. Bulb mode allows you to hold the shutter open for as long as you like so you can shoot in low light and use exposure times beyond the shutter speed range.

As you're already aware, a shutter speed is the measure of a period of time – in fractions of a second or whole seconds – that your camera's shutter is open for to allow light to hit the sensor during exposure. The light itself first passes through the lens aperture and then through the open shutter to the sensor. The amount of light that reaches the sensor to expose an image is therefore governed by how wide the lens aperture is, which is determined by the f/number selected, and how long the shutter is left open for, which is determined by how fast/slow the shutter speed is. These two controls work together and proportionally. A doubling of the shutter speed has the same effect on the exposure as opening up the lens aperture by one f/stop, while a halving of the shutter speed has the same effect as reducing the aperture size by one f/stop. So, if you took a meter reading with your camera and it set an exposure of 1/60sec at f/8, you could use any of the following aperture/shutter speed combinations in that same situation and achieve the correct exposure (see panel).

The combination you choose will depend on the subject you're photographing and the type of image you want to produce. If you want to freeze a fast-moving subject then your

priority will be to set a fast shutter speed, such as 1/500sec at f/2.8. But if you want to blur your subject to capture a sense of motion, 1/15sec at f/16 or 1/8sec at f/22 will be more suitable.

A further factor you can use to give you greater control over shutter speed choice is your camera's ISO. Every time you double the ISO you can halve the shutter speed, and every time you halve the ISO you can double the shutter speed. See the second panel below for an example of this.

Increasing the ISO so you can use a faster shutter speed is a useful fallback if you're struggling with low light – and as the image quality that DSLRs can achieve at high ISO is excellent, you need never miss a great shot due to the shutter being too slow. Where changing ISOs isn't so useful is when you want a slower shutter speed, simply because ISO 50 is the lowest ISO setting offered by DSLRs and as the default ISO rating is usually 100, you'll at best double the shutter speed/exposure time by setting the lowest ISO.

The best exposure mode to use when shutter speed choice is crucial is shutter-priority (S or Tv). With this mode, you set the shutter speed and the camera sets the aperture (f/number) to achieve correct exposure. If you change camera position, light levels change or you dial in exposure compensation, the shutter speed set will remain the same and the aperture is changed to maintain correct exposure, so you can control how movement is frozen or blurred.

Shutter speed/aperture combinations

1/500sec	1/250sec	1/125sec	1/60sec	1/30sec	1/15sec	1/8sec	1/4sec
f/2.8	f/4	f/5.6	f/8	f/11	f/16	f/22	f/32

ISO/shutter speed combinations

ISO 50	ISO 100	ISO 200	ISO 400	ISO 800	ISO 1600	ISO 3200
1/15sec	1/30sec	1/60sec	1/125sec	1/250sec	1/500sec	1/1000sec

FOCUSING ON MOVING SUBJECTS

The other main factor you have to consider when photographing a moving subject is focusing. Some moving elements in a scene, such as a waterfall, pose no problems. But when your subject is moving closer to or further away from the camera, such as a bird in flight or a speeding car, keeping it sharp becomes more involved.

The latest autofocus systems help a lot. If you set your camera to Continuous/Servo AF, as you track your subject, the focus will adjust automatically to stay sharp.

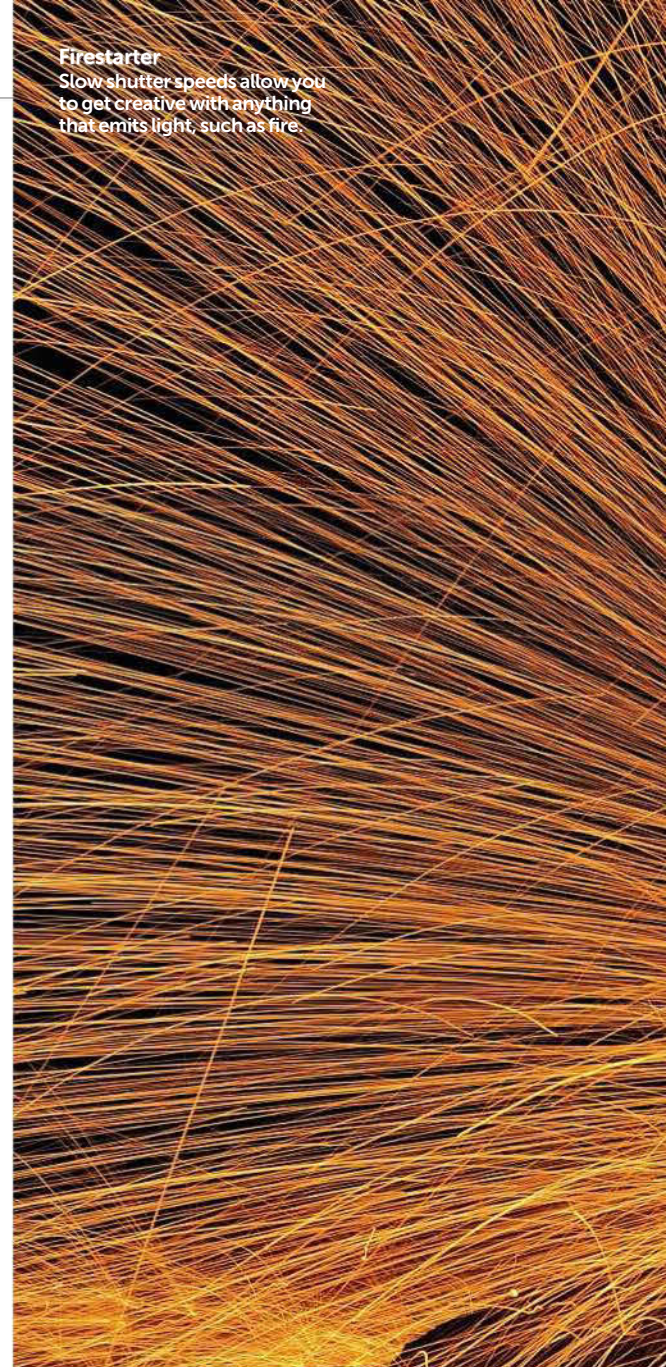
The only proviso is that you keep an active AF point over your subject – if you don't, the lens will shift focus onto whatever is behind that AF point. The central AF point tends to be the most sensitive, but it's not always convenient to have your subject in the centre of the frame, so get used to using off-centre AF points, and practise changing the AF point with the camera to your eye, so you're able to do it quickly while shooting.

Also look at ways of swaying the odds of focusing success in your favour. You may be able to select a group of AF points so that if



your subject strays away from one point, another one will pick it up to maintain focus. Similarly, many DSLRs have 'focus assist' points that extend the AF point's effective area. These features can make a big difference with fast-moving action because even if your tracking isn't 100% accurate, you'll still get an accurately focused image.

If you struggle to get decent results with AF, consider switching back to manual focus and learn how to 'follow focus', where you adjust focus as you track your subject. It's not as



Firestarter

Slow shutter speeds allow you to get creative with anything that emits light, such as fire.



difficult as it sounds! If your subject follows a set course, such as a car or motorbike on a race track, you can focus on a specific point then simply wait for your subject to approach that point and hit the shutter button fractionally before it snaps into focus. This technique, known as pre-focusing, is best done by focusing manually. If you use single-shot AF you'll need to keep the shutter release partially depressed so focus remains locked on the required spot, whereas if you focus manually you won't.



LEE FROST

Q&A: Shutter speeds

Q Is it easy to add motion to an image using Photoshop?

A Yes it is. If you open an image then go to *Filters>Blur*, you'll see a drop-down list of blur filters. Motion Blur and Radial Blur are the two most useful. Use Motion Blur to blur the background in an image so it looks like you panned the camera – select your main subject using the Lasso Tool then go to *Select>Inverse* and then apply the filter. Experiment with the Distance slider to vary the level of blur and also the Angle. Radial Blur is ideal for making stationary wheels look like they're moving – select a wheel with the Lasso Tool, go to *Filters>Blur>Radial Blur*, click on Spin and Best then experiment with the Amount slider.

Q Can you create a motion-blur effect by smearing Vaseline on an old filter?

A Yes, it's a tried-and-tested technique. Dig out an old clear filter such as a UV or Skylight, or even a clear piece of plastic, smear a tiny amount of Vaseline over it, then use your finger to put parallel streaks in the Vaseline.

When you put the filter on your lens, the Vaseline should make everything look streaky. It works particularly well on woodland scenes, transforming tree trunks into blurry streaks as though you panned the camera vertically while the shutter was open.

Q How do you shoot star trails – and where should I go to see them?

A An exposure of a couple of hours at a wide aperture and the ISO at about 400 should give you a decent effect. You need to be miles away from urban areas, though, otherwise light pollution will ruin your shots. Head out into the countryside, as far away from mankind as you can – deserts and mountain ranges are ideal for star-trail photography as there's little to no light pollution. Make sure your batteries are charged and the sky is clear so you can see lots of stars. If a full moon is out it will produce too much light, so wait until the moon is waning.

Use a compass to locate north so you can include the Pole Star in your shots. It will record as a bright white dot with all the other stars,

creating circular light trails around it. Also include some landscape in the bottom of the frame to add scale, and shoot with your widest lens so you can include lots of sky.

Hot pixels and noise are unavoidable with such long exposures, so turn on Long Exposure Noise Reduction. It means that at the end of the exposure, your camera will make another exposure of the same duration – this time with the shutter closed to map the hot pixels, so it'll be double as long before you see your shot, but it's worth the wait as without Noise Reduction images can look terrible.

Q What's the best way to zoom a lens to add motion to an image?

A All you do is set your camera to a slow shutter speed – anything from 1/8sec or slower – then as you trip the shutter, zoom the lens through its focal length range from one end to the other. This turns your subject into a series of colourful streaks converging on the centre of the frame and the effect looks stunning. Try it out on bold, colourful subjects.

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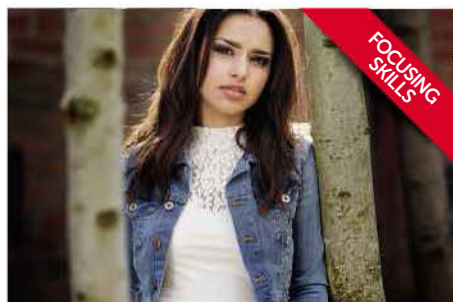
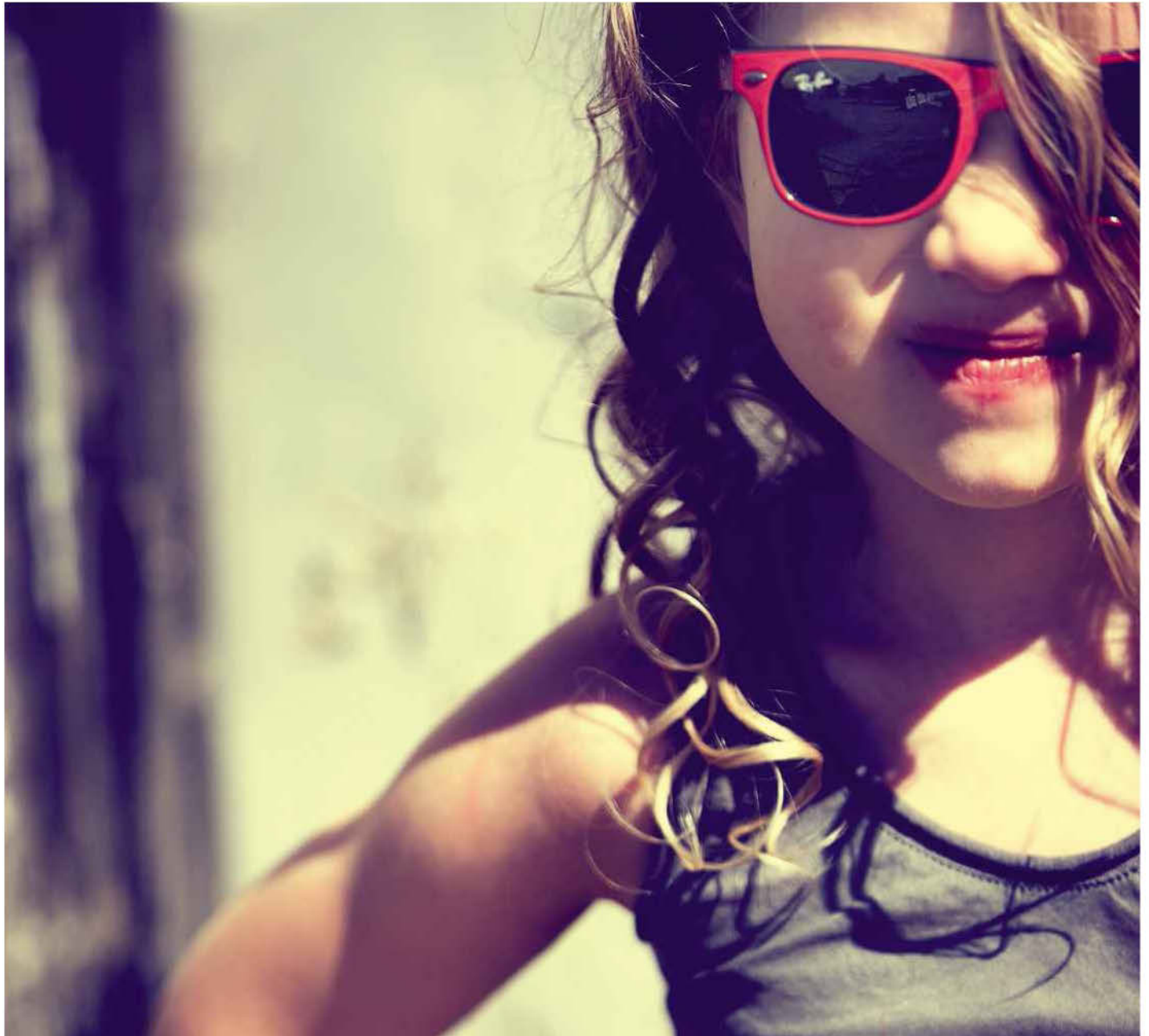
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PORTRAITS

LEARN THE BASIC SKILLS YOU NEED TO SHOOT STUNNING PORTRAITS WITH DAYLIGHT



Kit for enthusiast lifestyle portrait photographers

You're shooting friends, colleagues and even people you don't know, so you need a fairly sophisticated kit to improve results. You'll want 'fast' aperture lenses to isolate your subjects from a background, manual control of your flashgun for subtle lighting effects and gear to take your flash off camera. When you're shooting outdoors, you'll also need some filters to control bright light. Here's our choice of kit for your consideration.

Mid-range flashgun

As you get more confident with flash, a mid-range flashgun will help you experiment more. As well as TTL, they boast manual functions so you can reduce the power output for a more subtle effect when working close up. They also boast wireless capabilities for taking your flashgun off-camera and placing it to the side or behind your model for more impressive lighting. Models like the £210 Canon Speedlite 430EXII, £229 Nikon Speedlight SB-700 or £200 Metz 52 AF-1 have a slave function, which means they can be triggered by a burst of flash from your camera's pop-up unit. You can also control the output of each flash source in your camera's menu system to achieve the desired effect.

Mid-range DSLR

As you start to take your portraiture more seriously, you'll no doubt consider upgrading your camera. Generally speaking, mid-range DSLRs offer improved build quality over their entry-level counterparts, so they're equipped to handle a bit more hammer. They also boast higher resolutions for sharper images using low ISO speeds and they boast advanced features like wireless flash control: although some entry-level cameras feature this now, too. If you've already started investing in lenses from one brand, you'll probably want to stick with that manufacturer when you upgrade your camera body, but if you've not committed yet, the latest £500 Canon EOS 700D or £520 Nikon D5300 should go straight to the top of your list.

Fast standard zoom

Kit lenses are fine when you're starting out, but their general build quality and optical construction leaves much to be desired. When you're looking for a step up in quality, fast standard zooms are the way to go. They only cover the same focal length as your kit lens, but the fixed f/2.8 aperture at 50mm is perfect for portraits on an APS-C sensor and you'll appreciate the smoother zoom action and metal lens mount. Own-brand options can be expensive, but there's a range of third-party ones, too, like the £350 Tamron 17-50mm f/2.8 XR Di II VC or £450 Sigma 17-70mm f/2.8-4 OS HSM. Be prepared for some extra weight to carry, however, as the improved build and extra glass in these lenses makes them much heavier than your kit lens.

Fast-access camera bag

Lifestyle portraits involve grabbing those split-second moments, so you need to work quickly. Therefore, when you want to change lenses or swap memory cards, having a bag quite literally at your side is a real bonus. The £95 Speed Freak is the mid-sized bag in Think Tank's Speed convertible range, and allows you very fast access and lots of storage. It's an alternative to using a belt with separate pouches, such as the Tamrac Modular System or Lowepro's Street & Field series, both from around £10-£15.

Very 'fast' standard prime

The f/1.4 aperture of these lenses lets in twice as much as a f/1.8 lens, which is great when shooting in low light. Not only that, but the maximum aperture allows you to throw most of the image out of focus, just keeping small details like the lips and eyes in focus. For a more regular portrait, though, stopping down the aperture to f/2.8 provides cracking corner-to-corner sharpness. For around £300, Canon and Nikon have their own versions and third-party options include the £350 Sigma 50mm f/1.4EX DG HSM or the £300 Tamron 60mm f/2 SP Di II, which, although not as 'fast', doubles up as a 1:1 macro lens, too.





Lighting stand, flash bracket and umbrella

Once you start taking your flashgun off-camera, a whole host of creative possibilities open up. One of the most basic and classic approaches is to place your flashgun at 45° to your subject and use a reflective or shoot-through umbrella to soften the light. To do this, you'll not only need the umbrella itself, but also a flashgun bracket to attach your flashgun and umbrella to, as well as a stand so you can position it securely without having to hold it. Westcott do a collapsible umbrella flash kit that includes a stand, umbrella and flashgun bracket for £65.

Wireless flash triggers

Using a lighting stand and umbrella can have its problems if you're using your camera's pop-up unit to fire the flash. The sensor on the flashgun needs to receive the flash in order to fire and if you position the flashgun where your umbrella blocks the line of sight from your pop-up unit, the off-camera flash won't fire. This is where wireless radio triggers – which send a radio signal from your camera to your flashgun – come into play. With one transmitter connected to your camera's hotshoe and one receiver on the flashgun, you can place your flashgun out of direct line of sight and it'll still fire. Hähnel's £50 Combi RF is a brilliant buy.

Reflector on stand kit

Unless you've an assistant or a willing volunteer to handhold your reflector in the right place, operating your camera at the same time can be a challenge. A good solution is the Interfit Flat Panel Reflector & Stand package for £90 that features a 35x75in reflector, making it suitable for close-up or full-length shots.



Grip reflector

A reflector is an invaluable lighting aid, but can be difficult to position when you have no one around to hold it for you. The £55 Lastolite TriGrip gets around this problem by boasting a solid handle that you can grip with one hand while shooting with the other.

Wide-angle zoom lens

It's not a traditional portrait lens, as the distortion associated with wide-angles will stretch the proportions of your subject's face. That said, a wide-angle lens will give you another option in your armoury, allowing you to capture more of the surroundings and get shots others won't. They're also essential if you find yourself in a small or enclosed space where you can't get far enough back from your model. Again, own-brand options are available, or take a look at the highly recommended £370 Sigma 10-20mm EX f/4-5.6 or £570 Tokina AT-X DX 12-28mm f/4 Pro.

In the bag



Flash gels

Coloured gels slotted over your flashgun can produce colourful and fun creative flash effects. Try the Hönig HP-Filter 3 Colour Effects Kit, costing around £20.



Back-up body

A second DSLR body means you can have a telezoom attached to one camera and fast prime or wide-angle on the other, giving you multiple options without the inconvenience of having to keep changing lens.



White Balance aid

With most lifestyle portraits, you'll be mixing ambient and flash light sources, which makes it tricky for the camera to get the White Balance right.

Shooting in Raw and taking a quick shot of a grey card at the start of the shoot will help make sure the White Balance can be quickly and easily corrected across all your shots later in software. Check out the £16 Lastolite 30cm Ezybalance Grey Card.



Lightmeter

These aren't essential and many digital photographers get by without one, but when you start using off-camera flash and manual controls, they can be useful for getting your exposures spot-on. The Sekonic Flashmate L-308S offers a digital display, incident and reflected readings and four different modes for £140.



Filters

Many filter effects can be achieved in Photoshop – however, some can't, and for these you'll need to use filters. Polarising filters are great for adding more punch to your shots when shooting portraits in bright conditions as they reduce lens flare, cut out reflections and help darken down the blues in the sky. Check the diameter of your lens to get the right size filter, but, for an example, the Tiffen 72mm Circular Polarising Filter costs £60. ND grads also allow you to balance the exposure between a bright sky and darker foreground when taking wide-angle portraits. Screw-on ND filters are available, but a filter holder system gives you more flexibility as you can use it across all your lenses. The Cokin Z-Pro ND kit costs £144.



Tripod

A tripod is an unlikely bit of kit for a lifestyle portrait photographer as you'll usually need to change shooting position quickly as your subject, particularly younger ones, move around. There are lots of tripods available, including ones that let you shoot very low to the ground, but a good model to start with is the £120 Manfrotto 055XPROB. As an alternative, you might also want to look at monopods for flexibility.



Remote release

For a more relaxed or spontaneous moment, a remote release allows you to set a shot up and then move away from the camera to interact with the subject. One of the best budget buys is the £20 Hähnel RC280 Remote Release.

HIRE, DON'T BUY!

Can't afford premium lenses? Then hire them instead for a fraction of the price. Various firms offer great day, weekend or weekly deals, including Lens Pimp (www.lenspimp.com); Hire A Camera (www.hireacamera.com) and The Flash Centre (www.theflashcentre.com).



The basics of good portrait composition

THE ART OF COMPOSITION for the portrait photographer has many factors in common with other forms of photography, including landscapes, but also many differences, too. Fundamentals like the rule-of-thirds and lead-in lines still play a major part in the success of a portrait image, but other more unique considerations also apply. Unlike landscapes, you're in control of the subject and how they relate to the surroundings, and for most forms of portraiture, getting both to work together is key to great results.

Every scenario offers different possibilities and challenges for the photographer, so in this guide we provide a broad overview of the considerations you need to make when shooting portraits. As you'll discover, while close crops of head and shoulders require you to only concentrate on the subject's position in the frame, wider views also require you to determine their position and relationship within their environment.

A question that is commonly posed by newcomers to professional portrait photographers is: 'Where should I position the subject in the image, and how should I crop them in the frame?'

There is no correct answer to this question as there is no right or wrong rule that can be applied, only broad guidelines. Ultimately, a variety of variables ranging from the location to the pose to the purpose of the image will all influence how best you should pose your

subject. The easiest answer we can give is that before the shoot, have some idea of the type of image you want to capture so that once you're on location and your subject is ready, you can put these ideas into practice. However, you should also spend some time changing focal lengths and viewpoints, experimenting with wider shots that include plenty of the scene and tighter images where the head and shoulders, or even only the face, fill the frame.

Try different approaches and regularly review images, working hard on your favourites. While your priority will be your subject, always be aware of elements in the location that can be used to improve the overall composition of the image.

While fashion photographers often include the entire subject in the frame to show off their clothing, the face is relatively small in the frame, so tighter crops are preferable for more general portraits. Take care where you crop the subject – cutting them across the stomach or knee will result in awkward, unbalanced results. Normally, you'll find tighter crops across the hips work well, as do crops across the breast for strong head and shoulder portraits. If you're feeling adventurous, try cropping the top of your subject's head from the frame. While this might sound drastic, it's a commonly used tactic and, whether you're shooting tight head and shoulder shots or wider



ABOVE: Placing your subject centrally in the frame can lead to strong, energetic compositions.

compositions, works to place emphasis on the subject's face.

As with other forms of photography, applying the fundamental rules of composition will usually lead to better portraits. Follow our advice and techniques and you'll soon develop the skills required for perfectly composed portraits.

RULE-OF-THIRDS IN PORTRAITS

THE MOST IMPORTANT aspect of portrait composition is the rule-of-thirds, which involves placing the key focal point in the most suitable area of the frame to give the most balanced and impactful results. It's a simple concept to understand: visualise the image area split by two horizontal and two vertical lines equal distance apart. Where the lines intersect is generally regarded as the strongest position in which to place the main point of interest.

If you're shooting close-ups of the face or head and shoulder crops, the recognised way to go is to ensure that you focus on one of the subject's eyes and then ensure the image is composed so that the eye sits on one of the two upper intersections of thirds. When shooting full-length and three-quarter shots, the face is usually placed on or close to one of the intersections. This is the general rule and works well the majority of the time, but remember it's a guideline and not set in stone – as you'll discover, breaking this basic rule of composition can often deliver brilliant results, too. So use it, but

ABOVE RIGHT: The sofa leads the eye through the frame towards the subject, who is positioned on the lower left third of the frame.



always look for the potential to try out alternative compositions, too.

The most obvious way to break the traditional rules of composition is to place your subject slap-bang in the centre of the image frame. Forget thirds and intersections

– setting your subject so that they dominate the middle of your image can work a treat in certain situations. When taking portraits, experiment with the position of your subject in the frame, capture a series of images that you can study and learn from later on.



**Bc bold with
composition!**

Rules are meant to be broken, so don't be afraid to try out radical ideas like cropping part of your subject out of the frame.

SHOOT AT A SLANT

A TECHNIQUE THAT has proven incredibly popular in recent years, in particular with lifestyle, wedding and fashion photographers, is shooting portraits with the camera tilted at an angle. While this technique may sound a little odd, images taken when the camera is tilted rather than held perfectly vertical or horizontal can often add energy and visual friction to portraits.

The principle behind this technique is as simple as it sounds – compose the image as you would normally do, then slightly tilt the camera either clockwise or anti-clockwise so that the scene is slanted in the frame. How far you slant the camera is personal preference, but go too far and the results won't look good. You'll usually find between 15° and 25° is about right, but as there's no hard and fast rule you should experiment to see what angle works best.

This technique can be used whenever you fancy but works particularly well when the backdrop has strong lines running through it, as the diagonal lines add energy to the overall image. This is why you'll often find lifestyle photographers shooting portraits with the subject against metal shutter doors – the added visual interest works a treat.

A word of warning: use this technique in moderation. If used too often you'll find the impact of its effect is reduced.



Pro insight

BRETT HARKNESS "Angling the camera is a popular technique for adding energy to images and is also ideal to soften horizontal lines passing through a subject's head. However, it's used by many to disguise a poorly composed image. If you imagine the digits on a clock face, when angling the camera, I tilt it to either ten-to, ten-past, twenty-to or twenty-past, with the shutter button at 12 o'clock. While I used to regularly shoot at an angle, I use this technique far less frequently now."



HOW TO USE HORIZONTAL LINES

1) Even this straight composition is effective, with the pattern of straight lines perfectly horizontal and Emma placed along the right-hand third.

2) Shifting the composition so that Emma is dead centre of the frame and moving in for a tighter crop improves on the original frame and is an example of when not following the rule-of-thirds can lead to a more dramatic composition.

3) However, all those horizontal lines are crying out to be used to add dynamism and energy to the image. By recomposing the image so Emma's to the left and tilting the camera, the image suddenly has more energy and visual impact. However, the tilt of 45° is too much.

4) Adjusting the tilt to closer to 20° produces a better effect with the lines providing a strong visual lead-in to the subject; the tilt doesn't prove so overpowering.





● VERTICAL LINES

Lines that run vertically aren't as strong when used in a landscape-format image, so are best used with the camera in an upright (portrait) position. Using a similar technique to the previous example, a tilt of around 20° is used to add energy to the final result. Try this simple technique out for yourself!

Focusing for perfect portraits

THE EYES ARE the most important element of a portrait and so you should ensure you focus on them so that they are pin-sharp. Your camera's AF system is more than capable of locking focus on to an eye, but you do need to set it up correctly. While multi-point AF systems are useful for most subjects, they're not ideal when shooting portraits. This is because when multiple AF points are active, the AF system is designed to lock focus on the nearest subject. With portraits, this can result in the nose being in sharp focus with eyes slightly soft. If your subject is wearing a cap, then you might find times when their face is slightly out of focus.

This problem is very easy to get around. You simply need to set the camera so that only one AF sensor is active by switching to single-point autofocus. You have a choice of selecting the central AF sensor, which is usually the most sensitive, or any of the other AF points. Both have their merits.

With most cameras, the central AF point is more sensitive, often boasting a cross-type sensor as opposed to a normal line sensor, which improves AF accuracy when used in low-contrast situations. Therefore, if you're

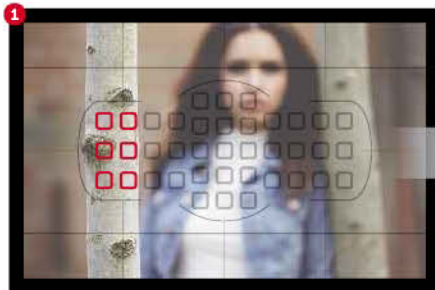
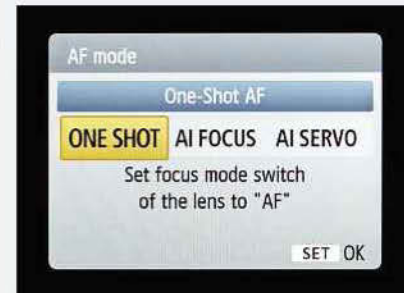
shooting in low light, use the central AF point. When using single-point AF, you want to ensure that the autofocus is single-shot AF rather than continuous AF. This is because when you focus, you place the eye in the centre of the frame, then after pressing the shutter button halfway down to lock the focus, you recompose the image before firing the shutter. In single-shot AF, the focus won't shift, but if you have it in continuous AF, the lens will change focus as soon as you move away from the eye, resulting in unsharp results.

Because you're moving the camera between focusing and firing, using central-point AF isn't the best choice if you have the camera mounted on a tripod. In this situation, it's best to select the AF point that falls over the subject's eye and, with single-shot AF selected, focus before shooting each frame.

The other time when using an off-centre point is best is when you're rapidly shooting several frames and don't want to have to use the focus-lock facility with the central-point. Normally this is when shooting groups with the subjects off-centre, or

How to set AF

By selecting the AF mode setting, you can switch between multi-point and single-point autofocus quickly and easily. Depending on which camera you use, you access this screen via the Menu or the AF mode button. Some older models have a physical switch to select modes. If choosing single-point, use the four-way control or input dials to select a specific AF point. The central point is the most sensitive and therefore usually the best option.



when using the camera in an upright position and firing short sequences with the subject making slight variations in pose or when you're shifting position.

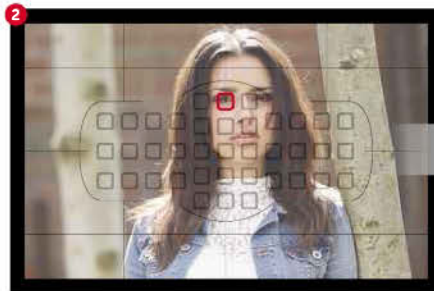
Ultimately, the choice is yours; some prefer the focus-lock method, others choose to use the appropriate off-centre sensor. Try out both methods and use whichever works best for you.

The following two sets of images provide examples of when switching from one AF set-up to another can lead to better results.

Focus past obstacles

1) Set to multi-point AF, the camera has locked focus on the tree in the foreground, resulting in our subject appearing very out of focus due to the shallow depth-of-field.

2) Selecting single-point AF, the subject rather than the tree is placed in sharp focus. The result is a portrait with the subject nicely framed by the two trees.



Focus on the eyes

3) Set to multi-point AF, the hat is detected as the closest subject to the camera and so this is where the AF locks on. Due to shallow depth-of-field, the face is unsharp.

4) Setting your camera to a single AF point is the solution. Take care to either select the AF point over an eye or use the central AF point and focus-lock over the eye. Here the AF point locked focus on the tip of the nose.

5) Using the central AF point, focus is locked on the eye and the image recomposed. A reflector was introduced to fill in shadows and lighten skin tones.

Tree's a crowd!
Use trees as a natural
frame for your subject
but be sure to take
control of focusing.
Exposure: 1/1250 at
f/3.2 (ISO 320).



How to expose for portraits

HOW YOUR CAMERA is set up to expose the scene is vital to the success of your portraits. On a practical level, while in most shooting situations you can trust your camera to give you perfect exposures every time, there are times it needs your help. On a creative level, your choice of exposure setting will determine the aesthetic quality of the image you produce. Therefore, it's essential you're always aware and in control of the exposure when shooting portraits to ensure you get the best possible result. Everything you need to know is covered over the next few pages.

Your choice of exposure mode dictates the level of control you have over your portrait, making your choice of mode a paramount consideration. The vast majority of amateurs and enthusiasts use aperture-priority mode as it's ideal for quickly

changing the aperture setting (and depth-of-field), while many professionals use manual, as it lets them control shutter speeds as well as apertures quickly and easily. Aperture-priority is without doubt the most popular mode used for shooting portraits as it concentrates attention on how apertures affect depth-of-field (covered in more detail shortly). Many photographers, including contributor Brett Harkness, prefer to shoot in program mode and use the 'program-shift' facility to quickly adjust apertures to their liking (check out our *Pro Insight* panels for details). There are situations when using manual mode is more appropriate, such as when shooting in difficult lighting situations or when using a lightmeter (also covered shortly). Try each mode and use whichever is your favourite!

Remember to use ISO!

While the aperture will be foremost in your mind when shooting portraits, be aware of the importance of shutter speeds and ISO ratings. You'll mainly be using telephoto focal lengths when shooting portraits, so camera shake is a potential risk when lighting conditions are anything but bright. The common rule is to ensure the shutter speed is at least the reciprocal of the focal length, so if the lens is a 55-200mm zoomed to 200mm, ensure the shutter speed is at least 1/200sec. If your camera or lens has an image stabiliser, you can get away with speeds that are two or even three stops slower, but be careful and regularly review magnified areas of images on the LCD to be sure. To ensure maximum image quality, you'll normally be shooting at a low ISO rating like ISO 100. If shutter speeds are slow enough to risk shake, you're far better off raising the ISO to 400 or even 800 to ensure images are free of shake. At these speeds any increase in noise or loss in sharpness and colour rendition will be minimal, especially if your camera is only a year or two old, so any slight loss in image quality is better than an image ruined by shake.

Metering: Watch out for tricky shooting situations!

Your camera's multi-zone metering pattern is the default setting and is incredibly accurate, with a success rate in excess of 90%. It takes an individual reading from each zone, compares this information with an image database in its memory, and then sets an exposure – usually with high accuracy. Therefore, when shooting portraits, making sure you get the correct exposure isn't something you should be too worried about, allowing you to concentrate on working with your subject and composing the best possible image. However, while it's very reliable, it's not infallible, so there are times when you need to be aware of assisting the metering system to ensure perfect results. The following are the most common situations that can cause problems, along with the easiest ways that you can ensure good exposures.



BRETT HARKNESS



BRETT HARKNESS



BRETT HARKNESS

● VERY DARK SKIN OR CLOTHING

Very dark subjects or backdrops can cause overexposure, resulting in bleached-out results. If photographing head & shoulder portraits of subjects with very dark skin, or scenes that are darker than average, be prepared to apply negative exposure compensation of -0.7 to -1.5EV or meter from a mid-tone instead.

● VERY LIGHT SCENES

Scenes that are lighter than normal can result in dark images being recorded due to underexposure. This is a particular risk for wedding photographers, in particular, who often shoot scenes where a bride in a white dress fills much of the frame. The fastest way to avoid this problem is to add positive exposure compensation of +1 to +1.5EV.

● BACKLIGHTING

A subject with the sun behind them is at risk of being grossly underexposed unless you take action. Either use the spot meter with an AE-Lock reading off a mid-tone in the same lighting as the subject, or apply exposure compensation from +1 to +2EV. It's a tricky lighting situation to master, so review images on the LCD monitor carefully.



Useful accessories



Grey card:

The most low-tech and affordable accessory in the photographer's gadget bag is a

life-saver in tricky lighting conditions. Have your subject hold it, lock a meter reading from it using the spot meter and you're ready to shoot.



Lightmeter:

More high-tech than a grey card and far more versatile, allowing you to take very accurate readings

in all sorts of ambient lighting conditions, as well as flash with most models. Hold in front of your subject's face, take a reading and you're sorted!



Reflector:

With backlit subjects, consider using one of these to bounce light back on to your subject, removing

unwanted shadows, revealing detail and adding a catchlight too!

Pro insight

BRETT HARKNESS

"When shooting in daylight, I prefer to use program mode along with the exposure compensation facility. I find it to be a very fast way to work – I can change apertures by using the input dial and override exposures quickly with exposure compensation. This allows me to interact with the subject rather than worry about camera settings. Once I've taken a test shot and applied any necessary exposure compensation, I can use the program-shift facility to set the aperture to my preferred setting and start shooting. In terms of metering pattern, I usually stick to multi-zone, which is very reliable, switching to spot for very high-contrast scenes."



Metering options



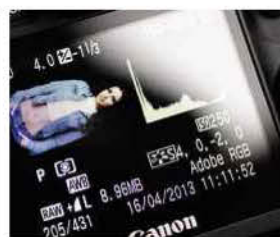
● Exposure compensation

Use this facility to override the indicated exposure by a set amount. A positive value increases the exposure; a negative value reduces it. Most cameras allow up to +/- three or five stops in 0.3 or 0.5-stop increments. One of Brett's favourite features.



● Spot-meter with AE-Lock

The spot meter takes a very precise reading from around 3% of the image. Place the central 'spot' in the viewfinder over a mid-tone, lock the reading using the AE-Lock, recompose, then shoot for perfectly exposed results.



● Histogram This facility allows you to review an image and note the distribution of tones from highlights to shadows. This allows you to see if the exposure is good or needs adjustment. Your aim in general situations is to have the peak at the centre.

Choosing and using lighting aids

They're not glamorous by any means, but lighting aids are a mainstay in the portrait photographer's arsenal of tools. While being relatively inexpensive, reflectors and diffusers make a major difference to how light falls on your subject. Here are the basic facts and techniques you need to get to grips with when using lighting aids

REFLECTORS

IF YOU DON'T ALREADY own a reflector, then hang your head in shame. These versatile lighting aids can make or break a portrait, are as suitable on location as they are in a studio and can be used with daylight, flash or studioflash. There are various types available (see panel below for details) in all shapes, sizes and reflective finishes to suit different uses and all of your photographic needs. In this guide, we provide an overview of the basic ways you can use reflectors in daylight, but as you'll discover over the coming months, these highly affordable aids offer incredible versatility in a variety of lighting situations.

If you're looking for your first reflector, then we'd recommend you consider a low-cost, high-quality 5-in-1 kit. These can be had for under £10 in some cases – see the panel below for details. For anyone just starting out taking portraits, these kits represent the best value, boasting a translucent disc that can be used as a diffuser, along with a reversible sleeve that offers silver, gold, white and black surfaces, covering everything you'll need in a reflector.

As you'll discover, it's incredibly easy to use a reflector. All you have to do is angle it towards your subject to bounce light towards them. However, a reflector can be a



Reflectors come in all shapes and sizes

crude instrument, so it's worthwhile taking the time to understand how reflectors work and what they can do for your images so that they improve rather than degrade the quality of your portraits. To really make the most of reflectors, it's important to understand how various factors, such as the distance to your subject, different lighting conditions and the colour of the reflective surfaces all strongly influence the intensity and colour of the light falling on the subject.

Different photographers have their own preferences as to which reflector they enjoy using most, so there is no definitive answer. However, there are some guidelines you can follow that will help you make the right choice (see panel below).

Pro insight

BRETT HARKNESS ON... SHOOTING IN SUNLIGHT

"In direct sunlight, I'll generally always have the sun behind the subject and expose for the face. I'll almost always use a Lastolite Sunfire/Soft Silver reflector to fill in shadows. On very sunny days, I'll use a white/silver reflector and aim it down to bounce the light off the ground, as this gives an effect that is cooler and more flattering than direct reflectance. I'll never use solid gold or silver as I find its effect too obvious. When shooting in sunlight, I expose for the highlights and avoid having the subject look towards me as they'll be squinting. I'll often use this technique at weddings – using sunshine as a background makes it more of a fashion shot than a standard portrait. I don't use diffusers that often, but they are useful when shooting in open areas with no shade. While there are large, expensive options available, I find a diffuser panel from an inexpensive 5-in-1 kit fine for tight head and shoulder crops."

Which type of reflector is best?



● ROUND COLLAPSIBLE REFLECTORS

By far the most popular due to their low price (prices start under £15) and choice of reflective finishes. They're available in different sizes with 80cm and above being the best choice for portraits. Those on a budget may want to consider the 5-in-1 kits made up of a diffuser disc and reflective sleeve with four colour options. One such model made by budget brand Neewer comes in at less than £10 for its 110cm (43in) 5-in-1 kit – who can argue with that?



● GRIP REFLECTORS

If you're regularly shooting solo, a reflector with a handle makes life so much easier. The biggest range is the TriGrip series by Lastolite, which pioneered this type of reflector. For portraits, a medium size (around 75cm) is a good choice, although the wider coverage of larger sizes is preferable if you can afford one. Those on a strict budget should check out bargain brands from the likes of CowboyStudio and Neewer – both offer great value for money products.

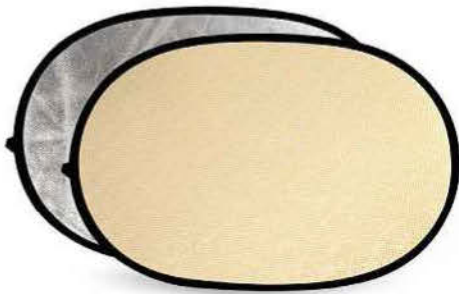


● FRAMED REFLECTORS

Expensive, but the ultimate in size and versatility. They are usually handheld, but dedicated booms are also available that allow you to angle them to your needs. California Sunbounce and Lastolite are the two main brands, each offering an excellent choice of options. For most, the small or medium sizes should be suitable. They're very well made and offer a wide range of reflective finishes – just be prepared to pay upwards of £150 for decent kits!

Different reflector colours

More important than the type of reflector is the colour of the reflective surface. As well as influencing the colour of the light being reflected back on to the subject, the reflector's finish also determines its efficiency – or, in other words, the intensity and range of the reflected light. Here we cover the most common reflective finishes.



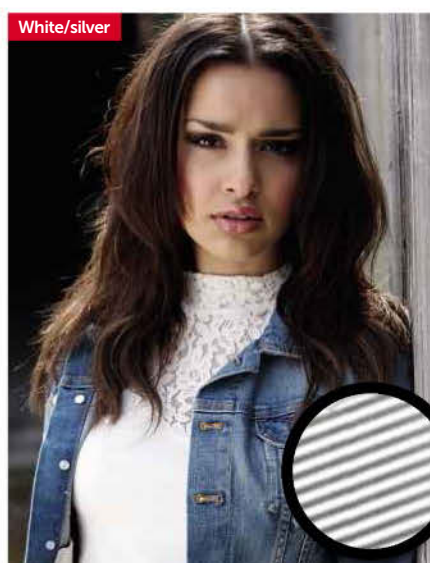
● WHITE REFLECTORS

Less efficient than metallic finishes, meaning they must be placed closer to the subject to have an effect. It makes them a good choice in strong sunlight if you're able to use them close to the subject without intruding on the image area. The light they bounce is softer, too, so they do produce a very flattering effect, filling in shadows and adding a pleasant sheen to skin texture. The subject's eyes benefit from a nice catchlight without the side effect of squinting.

● METALLIC SURFACES

These bounce light much further than white, making them a better choice if the subject is some distance away or when working in overcast light. When used in shade or on very cloudy days, metallic finishes can bounce a remarkable amount of light back on to your subject. However, because they are so efficient, they can be overpowering in sunlight if used too close to the subject, so greater care must be taken. Also, the strong hotspot on their surface is more likely to cause your subject to squint if they're in their line of sight. Silver is by far the most popular metallic choice, providing a very clean and bright effect. Used at the right distance, its effect can really lift tones and bathe subjects in a very clean, neutral light. Gold has a similar efficiency to silver but produces a warm effect similar to light just before sunset. It's ideal if you are shooting in shade and the colour temperature is cool, or when you want to replicate warm evening light, but it's a colour you must take care with as it can be overpowering and create very artificial results.

If you want to add an injection of colour into the light you bounce, the best option is to go for a hybrid-reflective colour such as Sunfire. These have been developed to provide a high-efficiency reflective light that adds warmth to subject's skin tones that are more natural and less intense than gold. You'll find a variety of these hybrid-metallic finishes generally based around different mixes of gold and silver.



DIFFUSERS

ALTHOUGH NOT AS commonly used as reflectors, diffusers are an important and useful lighting aid when you are working in harsh lighting conditions, such as in strong directional sunlight. Diffusers are made of translucent material and placed between the light source and the subject. As well as reducing the amount of light reaching the subject, the diffuser softens the light so that they are bathed in a soft, flattering light and free of shadows. Diffusers come in various efficiencies that determine their light-stopping capabilities, with 2/3 to 1.5 stops being the most popular. The larger the diffuser panel, the easier it is to ensure the entire subject is under cover of diffused light, although in windy conditions they are more difficult to hold steady. If you're on a tight budget, the collapsible disc in a 5-in-1 reflector kit is suitable for use, although its relatively small size limits the area it can throw into shade.



● USING A DIFFUSER IN HARSH LIGHT

You're less likely to use diffusers than reflectors, but they're ideal aids when you want to shoot on location on very bright, sunny days.

1) Place your subject facing the sun and this is the result – unsightly shadows across the face and dark sockets where the eyes should be!

2) Placing a diffuser panel so it sits between the light source (the sun) and the subject results in a far more pleasant and flattering result.



Recommended diffusers



● DISC IN 5-IN-1 REFLECTOR KIT

www.amazon.co.uk

The cheapest diffuser you can buy. Its small size makes it suitable for smaller subjects like kids or for head and shoulder shots of adults. The diffuser material cuts out a fair amount of light, but in very bright conditions this shouldn't be a problem. You can pick up a Neewer 5-in-1 kit for under £10 – bargain!



● CALIFORNIA SUNBOUNCE SUN-SWATTER

www.sunbounce.com

A firm favourite with pros, this is one of the most expensive aluminium frame diffusers on the market but also the most durable. Available in three sizes (1.2x0.9m, 1.82x1.22m and 2.44x1.83m) with a choice of fabrics, the frame can be fitted with a boom, allowing it to be held at height above the subject. Kits start at around £250.



● LASTOLITE TRIGRIP DIFFLECTOR

www.lastolite.com

A handy dual-purpose reflector panel with moulded handle that can be used as a 2.3-stop diffuser or bounce reflector (Soft Silver or Soft Gold). Available in three sizes (18in, 30in and 45in), these offer a useful all-in-one option. Prices start at under £50. If you're regularly shooting on your own, the fact it has a handle makes using it far easier.



● LASTOLITE SKYLITE RAPID

www.lastolite.com

A popular choice with pros, the Skylite Rapid is made up of a lightweight aluminium frame with interchangeable fabrics. Choose between a 0.75 or 1.25-stop diffuser or a difflector finish with 2.3-stop diffuser and choice of reflective surfaces. Available in three sizes: small (1.1x1.1m), medium (1.1x2m) and large (2x2m), from around £100.

2

Diffuse the situation!
A diffuser allows you to shoot softly lit portraits, even in harsh sunlight.



Controlling bright sunlight

A bright summer's day may seem the ideal time to shoot outdoor portraits, but only if you know how to diffuse harsh sunlight to produce flattering results

THERE ARE MANY BENEFITS to taking photos outdoors on a day when the sky is blue and the sun is beaming. Light levels are very high, so you've a full range of apertures and shutter speeds to choose from, even with the ISO rating set to a low sensitivity for maximum image quality. Also, because the weather is warmer, subjects are happier to sit and pose for you and you've a full choice of outfits for them to wear. Plus, because the light is so bright, colours tend to be punchier and saturation higher, which all helps to add extra impact to images.

However, there are also drawbacks to take into account. The first is the most obvious: sunlight is very bright and direct, so if your subject is facing it, they will most likely be squinting and their face and chin will have very harsh shadows, which amounts to a very unflattering portrait. Facing them away from the sun is one solution, but you'll then need to watch out for flare, as well as cope with a subject whose face is in deep shadow. The high contrast between the bright background and the subject also means that you'll have to be careful with metering to ensure that the subject isn't underexposed.

The other solution, which we illustrate here, is to use a diffuser panel, placed between the sun and the subject, to bathe the model in a far more flattering light. In effect, you're shading the subject from the sun, but using a diffuser offers a number of differences to placing the subject within a shaded location. The nature of light passing through a diffuser is very non-directional, much like shade, but because the light has passed through a white material, it's neutral, clean and retains a relatively high level of illumination. Whereas in the shade, the light is reflected off surfaces, which, if coloured, will influence the light falling on the subject. And, because the light has bounced off one or more surfaces, it will be dimmer, meaning you have less choice with exposure settings.

The other key difference is that by diffusing direct sunlight, you're not limited in terms of location. You can shoot from the middle of a garden, beach or park, or anywhere else that suits your fancy, as you're able to use the diffuser panel to control the light falling on the subject. And as the diffused light is even, you can shoot from any direction, therefore being able to place the subject against a backdrop of your choice.

Shooting into light

If you don't have a diffuser, you can try shooting with the sun to your subject's back and to find a position where the sun is obscured from view. Using the leaves of a tree is one option, or, as in this example, a wide-brimmed hat provides a very photogenic solution. Use a white reflector to bounce light back towards the subject and either use AE-Lock to take a reading from their face, or add between +1 to +2 stops of exposure compensation.



Sunlit step-by-step

For this simple step-by-step, Daniel Lezano took some pictures in a garden using a Lastolite Skylite, which is a large diffuser panel that requires at least one person to hold it. Smaller panels that are easier to handhold are available, but bear in mind that the area of diffused light will therefore also be smaller. For a truly budget-conscious diffuser, look at our suggested 5-in-1 reflector kit on page 160 for further details. As you'll see, reflectors also have their part to play in manipulating the light to better illuminate the subject and help produce the effect that you want. In this shoot, the camera was set to aperture-priority mode at f/5.6 (ISO 100) and White Balance to Daylight.

1 Set-up Here's the basic set-up for the pictures. We're shooting around 3pm so the sun's still very high in the sky, and the diffuser has to be held over Ruby's head. You can see the large area of diffused light it produces beneath her.

2 Test shot This is the result of this basic set-up. Because the sun is obscured by the panel, Ruby isn't squinting and as the diffuser is just above her head, her hair has an attractive highlight. However, while the light on her face is fairly even, there are still some faint shadows that need removing.

3 Add a reflector To add a little colour to the diffused light, I place a Lastolite Sunfire reflector on the grass within the diffused shade, angled up towards Ruby's face. It's a powerful reflector, but as I'm positioned under the panel its effect doesn't cause Ruby to squint.

4 Spot-on lighting The resulting image is much better than the shot captured using the diffuser alone. The light from the Sunfire's surface has added warmth to Ruby's skin and has evened out the shadows. The result is more than satisfactory, but I'm not happy with the pose so I want to try something else.





Final image

I ask Ruby to lie down on her front and I do the same. As she's very close to the Sunfire reflector, the effect is too strong, so I turn it over to the white surface. Its effect is far softer and more neutral and, along with the pose, gives a better result.

How to take portraits under cover

If you're ever struggling to work with harsh direct sunlight, one easy way to control the light is to step into some shade. We show you how to go about it...

WHEN THE SUN IS STRONG and high in the sky, there's often nowhere to escape its harsh rays and high-contrast conditions. So if you're after a wide, smooth tonal range with limited contrast and better control but you don't have a diffuser, your best chance for success is to find cover in a spot of shade, such as under a tree or beside a building.

Placing your subject in some shade instantly improves lighting and gives you more control over the strength and direction of the ambient light. Just remember that the light will be softer, cooler and more diffused, so you'll also have lower light levels to consider, as well as potential colour casts.

As shade is naturally cooler than sunlight, as well as setting your White Balance to Shade, you may want to opt for a reflector that adds warmth, such as a gold reflector or Lastolite's Sunfire/Silver reflector. You will also need to be aware of surrounding colours, because dark surfaces absorb light while pale ones reflect it. Watch out for strong-coloured surfaces, too, as they may reflect coloured light, so don't place your subject too close and be aware that you may need to adjust your White Balance settings appropriately, or shoot in Raw so you can correct any colour cast later.

When shooting in shade, you need to be aware of where the light is coming from, which can be tricky as it's likely to be bouncing off different surfaces like walls and floors at various angles, but with practice you'll learn how to master it. By placing your subject in the shade, an easy way to control the strength and direction of light is to vary the subject's distance from the shade and sun; the closer they are to leaving the shaded area, the stronger the light. You can further control light by moving a reflector towards or away from the subject. You can also control the contrast by where you position your subject, for instance half in the light and half in the shadow, or with their back to the light so they're backlit. If you try the latter technique, position a reflector in front of your subject to reflect light onto the face to fill in any shadows. You could also try turning your back to the sun, and have your model face you – it will cast a very flattering, soft and low-contrast light over their face.

Learning how to work with shade is useful when shooting on sunny days, especially if you're dealing with subjects who are wearing clothes that are near white or black in tone, or are dark-skinned, as bright conditions can be an exposure nightmare.

White Balance

Most beginners keep their White Balance set to Auto and normally get good results, but selecting the White Balance to match the lighting conditions will provide a more accurate result. For instance, by setting AWB, a photograph in shade looks very blue, but changing the WB to Shade will provide a warmer result. You can take things even further by using the Custom WB setting or one of the other presets to produce images that deliberately have a warmer or cooler tone.



Shooting in shade



We asked pro photographer Brett Harkness to show us his process for shooting in shade. This alleyway was perfect; it offered some shade and the contained light meant it was soft and easily controllable. To get the right level of light on Emma, his model, he had her walk very slowly from inside the alley towards him and the light until he was happy with how her face was illuminated.

1 Try different settings As light levels were low, Brett started with a wide aperture of f/4 and cranked up his ISO to 640 to generate a fast enough shutter speed to shoot handheld. The first few shots he took were good but even though the background is blurred, there's still a lot going on. Brett zoomed his lens in closer to make a tighter head-and-shoulder crop. Much better!

2 Experiment with poses For a different shot, he positioned Emma leaning against a wall but by moving her the light on her face was reduced, so he brought in a reflector. We opted for the silver-strong side of the Lastolite Sunfire reflector as it gave the strongest reflectance and filled in a lot of the shadows.

If you're using a wide aperture you need to be very careful where you place your focus point. Here, Brett has focused on Emma's eyes using selective focusing, which has thrown the foreground and background out of focus. The wall also provides useful lead-in lines to Emma's face, strengthening the composition.

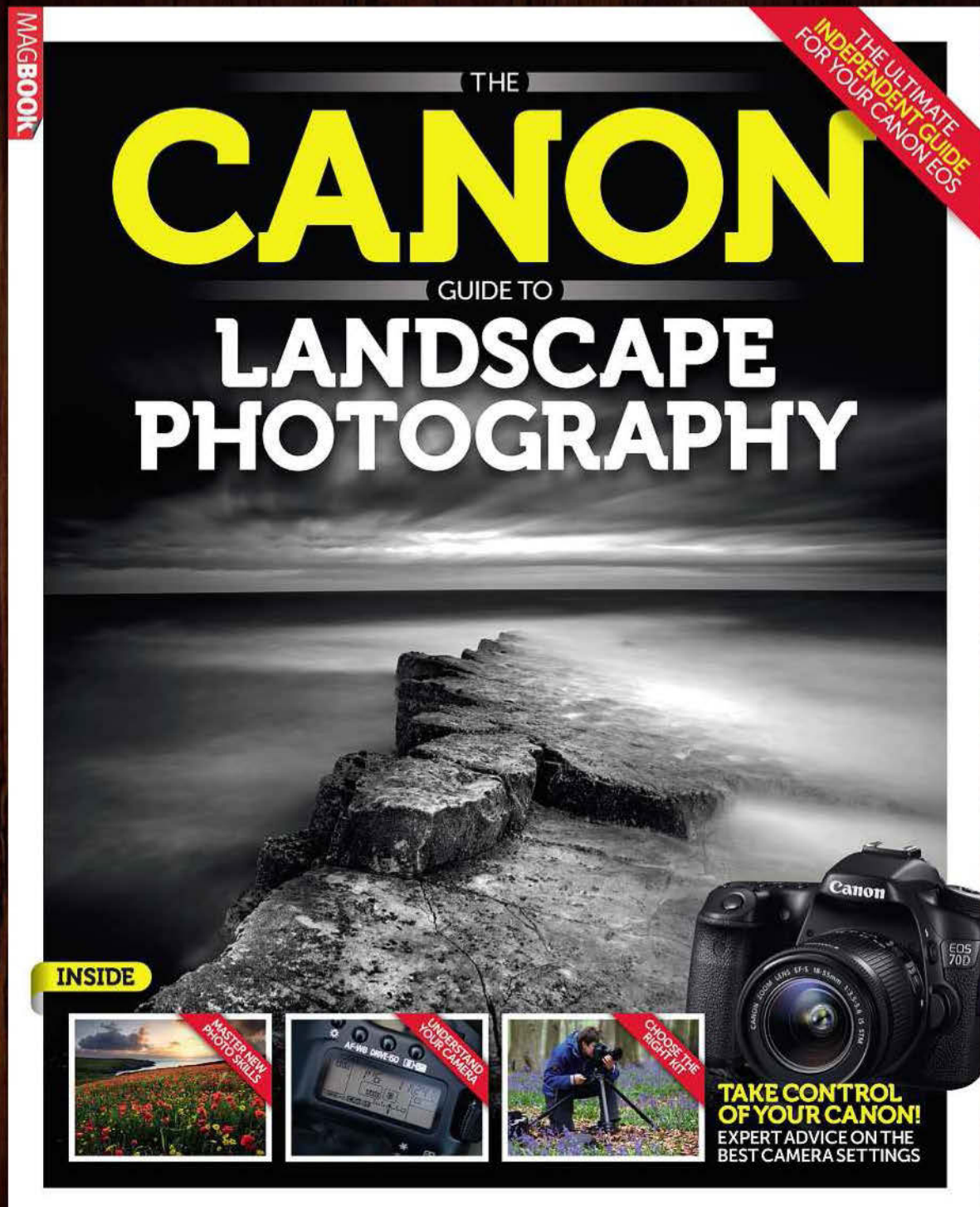


Final image

We picked our favourite and converted it to black & white. Note how the shaded light produces beautifully smooth skin tones.



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LANDSCAPES

Landscape photography has to be the most popular subject out there, and the reason why many of us picked up a camera in the first place. It's impossible not to be awe-inspired by an amazing scene, and hard to resist the temptation to capture an image of it. Fortunately, taking great landscapes isn't as difficult as it may seem. The technical side of things is straightforward and you don't need bags full of expensive gear. The key to success is having an appreciation of the world around you, an ability to turn what you see into a powerful composition and, most important of all, a really loud alarm clock that will wake you at silly o'clock so you can capture the light at its best. Oh, and this indispensable guide to shooting great landscapes...

Essential kit for landscapes

One of the great things about landscape photography is that you don't need to invest in expensive specialist equipment. Sports and wildlife photography require long telephotos; close-ups are best shot with a macro lens. But for landscapes you can get away with a modest outfit. Just as well because you've got to carry it everywhere – it's surprising how heavy camera kit can be when you have it strapped to your back!

1) LENSES

Wide-angle lenses are the order of the day here. Not only do they capture more than the naked eye can take in, but they also stretch perspective so the elements close to the camera loom large and dominate while everything else appears small and distant. Depth-of-field is extensive too, so it's easy to record a scene in sharp focus from front-to-back, as we'll discuss later.

Modest focal lengths around 24-28mm (16-18mm on APS-C sensors) are ideal as they give you all the benefits of a wide lens without being so wide that you end up with empty compositions. However, focal lengths down to 16mm (10-12mm on APS-C) can also produce amazing results when used with care as perspective distortion and depth-of-field are extreme.

Mid-range focal lengths in the 50-80mm range (35-50mm on APS-C) are ideal for detail shots as you can focus close and fill the frame. The perspective is also less exaggerated so they're ideal for simpler, less in-your-face images.

Telephotos come into their own when you want to isolate part of a scene, or compress perspective so the elements appear crowded together, such as distant hills or avenues of trees. Focal lengths from 70-200mm (100-300mm on APS-C) are more than long enough.

2) TRIPODS & HEADS

You shouldn't underestimate the importance of a good quality tripod for landscape photography. From a purely practical point of view it will eliminate camera shake from your images so you can use a low ISO for optimum image quality, utilise slow shutter speeds for creative effect, stop your lens down to f/11 or f/16 to maximise depth-of-field and shoot in low light without worrying about camera shake. Once your camera is mounted on a tripod its position is fixed, so you can set up a shot, align filters, focus, then wait for the light to be just right before you shoot. Using a tripod also slows down the picture-taking process, so you tend to spend more time studying the composition, thinking about a shot and fine-tuning it. Long-term this will lead to improved images and a better understanding of what works.

Choose a tripod that's sturdy enough but not overly heavy. Carbon-fibre is the best choice and Manfrotto, Gitzo and Giottos are the favourite brands among landscapers. You'll also need a good quality head. Ball heads are popular because they're compact, strong and quick to use. Brands to check out include Manfrotto, Giottos, Benro, Indura, Arca Swiss and Really Right Stuff.

3) FILTERS

Filters still play an important role in landscape photography (no matter what the blokes down the camera club say), so if you don't have any right now, be sure to add them to your shopping list. The three main types of filter you need for landscapes are ND grads, solid NDs and a polariser – see the panel opposite for our suggestions.

Slot-in filter systems are by far the most versatile as they allow you to use all three filter types together if you need to. There are options to suit all budgets, from well-known brands such as Cokin, Hitech and Lee Filters and very cheap systems from unknown brands, like XC Source, which we reviewed on page 150.

You'll need a filter holder that's big enough to cover your widest lens, plus an optional ring (if required) so you can attach a polariser to the holder itself if it doesn't slot into it. Filter adaptor rings to fit each lens are also required and if you want to keep your filters in tip-top condition you'll also need a multi-pocket wallet to store them in.

If you want to protect the delicate front element of your lenses, invest in good quality screw-in Skylight or UV filters from Hoya, Sigma, Kenko, B+W or Tiffen, and ideally buy filters with slim mounts so they don't unduly increase the risk of vignetting with wide-angle lenses when you use a filter holder. Alternatively, you can take the protective filter off the lens before attaching the holder.

4) REMOTE RELEASE

The smallest of movements can affect image sharpness – even pressing the shutter button! A remote release allows you to trigger your camera's shutter without physically touching the camera. They are available wired or wireless, and in a range of styles from a no-frills release to more complex intervalometer units. Don't discard budget units – most offer the exact same features as branded items for much less.

5) BACKPACKS

Whatever gear you decide to use to shoot landscapes, you're going to have to carry it, so make sure you invest in a decent backpack to make that task as pain-free as possible and also protect your gear from the elements. All the best-known brands make great packs – Lowepro, Tamrac, Think Tank and Kata. It doesn't have to be waterproof, but it should come with a waterproof cover that you can use when you get caught out in the rain – which you will! It should also have a comfortable harness system with a waist belt and chest strap, and come with plenty of adjustable padded protection inside so you can organise your kit.



6) DRESS FOR THE JOB

If you're going to spend all day in the field, you need to make sure you're comfortable. In warm weather, solar dry cargo pants, lightweight hiking boots or shoes and a softshell jacket will be ideal, with maybe a lightweight waterproof layer in your backpack in case it rains or the wind picks up. Spring and autumn days can go from cold to hot in a few hours. You may need a hat and gloves for dawn sorties plus heavier trousers and a more substantial jacket. Wear two or three layers so you can remove them as the temperature rises. In winter, layers are also recommended as they trap air between which warms up and provides further insulation. Wear a hat to keep your head warm and reduce the loss of body heat, gloves for hands, thermal underwear, windproof trousers and a softshell jacket, then a Gortex jacket and overtrousers as an outer layer to keep you warm and dry. The more comfortable you are, the more you can concentrate on the task in hand.



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Suggested landscape kits to suit every budget

● GETTING STARTED

You have an entry level DSLR with an 18-55mm zoom. The bottom end of the zoom is an ideal focal length to get you used to composing wide-angle scenes and will let you see if shooting landscapes really is for you before you splash out on more glass. You'll need filters – a couple of ND grads, a polariser and a solid ND or two. The Cokin P-series is the perfect beginner system as it offers a compromise between size, quality and cost. You can kit yourself out with all of the above, plus a filter holder and adaptor ring for about £130. If you can't stretch to that just yet, leave out the polariser, which costs £72.

You can buy cheaper tripods, but a model like the Manfrotto MK393-H (E52) will keep your camera steady and not break the bank. A cheap remote off eBay (E5) and a backpack like the Vanguard BILN 37 (E30) and you're ready to roll.

● GETTING EXPERIENCED

As your enthusiasm for landscapes grows you'll want to extend your system as well as your creative horizons. Maybe it's time to trade in the kit zoom for better quality glass, like a Tamron SP 17-50mm f/2.8 VC (E350), Canon 15-85mm f/3.5-5.6 IS USM (E520) or NIKKOR 16-85mm f/3.5-4.5G VR ED (E440). For filters, consider the Hitech range – an 85mm ND Master kit comprising three ND grads and three solid NDs plus a metal holder and adaptor ring will cost £110. You'll need to add a polariser as well – look at options from Hoya, Heliopan and Tiffen. You might also like to experiment with long exposures – the Hitech ProStop IRND 3.0 is £75.

If you need a decent budget tripod, check out the £80 Velbon Sherpa 5370D. An affordable backpack like the LowePro Fastpack 250 (E69) will carry all your kit and leave space for snacks.

● GETTING SERIOUS

We'll assume you've got a good APS-C DSLR and a quality standard zoom. It's time to add a wider zoom – the Canon EF-S 10-22mm f/3.5-4.5 USM (E670), NIKKOR 10-24mm f/3.5-4.5G AF-S (E640) and the Sigma 10-20mm f/3.5 EX DC HSM (E460) are all great optics. For telezooms, consider the Canon EF 70-200mm f/4 IS USM (E890), NIKKOR AF-S 70-200mm f/4G ED VR (E1,100) or Sigma 70-200mm f/2.8 EX DG OS HSM (E900). You'll need a 100mm filter kit, too. The Hitech 100 with three ND grads, three solid NDs plus metal holder and wide adaptor is £290. The Lee Filters equivalent costs around £500.

Tripod time. The Giotto's Silk Road YTL 9383 with MH5002 ball head (E180) or Manfrotto 055CXP3 (E250) with 496RC2 ball head (E60) are both great. Bags – take your pick, though the Benro Ranger Pro 600N (E130) is ideal.

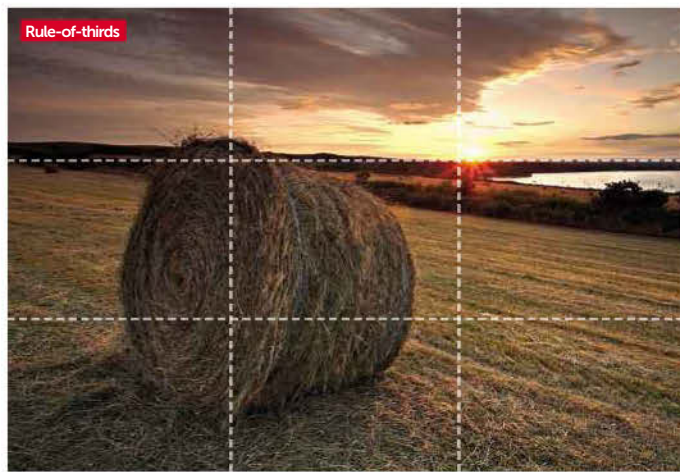
Creating balance: The rule-of-thirds

Before you shoot a single image, you need to practise this simple framing technique

THE WORD 'BALANCE' implies an equal weighting. In a picture, this would mean symmetry, but visual balance – or rather harmony – is not usually achieved this way. Placing a subject centrally in the frame usually results in a static, rather than a dynamic, composition. An off-centre subject, on the other hand, encourages the eye to move around the scene, resulting in a more engaging picture.

One way of dividing the frame up to achieve harmony is to use the rule-of-thirds. This is a simplified version of the 'Golden Section', a proportion that has been used in art and architecture for centuries. This proportion also occurs with great frequency in nature, and there is research to suggest that our brains are hardwired to respond positively to images and objects that follow this rule of proportions – for example, people whose faces are proportioned according to the Golden Section tend to be thought of as more attractive.

The practical application of this in landscape photography is to divide the frame up into thirds, horizontally and vertically, and organise the elements in the scene to fit into the grid; it's common, for example, to place the horizon on one of the dividing lines. The points where horizontal and vertical lines intersect can be particularly powerful places for strong focal points to sit.



Right: This image follows the rule-of-thirds quite closely. There is approximately two-thirds land and one-third sky, the main part of the hay bale is in the left third of the frame and the sun is placed on an intersection of thirds.



Breaking the rules: Horizons

Like all rules, however, the rule-of-thirds needs to be applied with judgement rather than as a matter of course, and there will always be situations where it needs to be ignored. It's best if you think of the rule-of-thirds more as a guideline as there will be instances where applying this 'rule' doesn't strengthen an image. For example, when shooting a scene where the sky is reflected in water, you might well want to place the horizon across the middle of the frame, giving the two elements of the shot – sky and reflection – equal weighting. If there is no interest in the sky, the horizon can be placed higher in the frame or cropped out altogether, or to increase a sense of emptiness and isolation, the horizon can be placed very low in the frame for a big sky landscape. The beauty of shooting digitally is reviewing your efforts and shooting to ensure the perfect composition for the scene.





TOP TIP

Order & balance

Good landscape composition often involves imposing order, balance and symmetry. Try looking for a single, dominant element that can be placed in the frame according to the rule-of-thirds

Experiment with viewpoints

Finding the right viewpoint is important to achieve a successful landscape composition. Rather than shooting everything from head height, experiment with high and low viewpoints. Higher viewpoints have the effect of opening up the planes in the image and are useful with standard and telephoto lenses. Shooting up from a low vantage point, it can add immensity to your shots. When photographing well-known landmarks, it's tempting to use the established viewpoints, but spend time looking for a fresh view, as it's much more satisfying to capture an image that's original.

While there's nothing wrong with the first picture, it's the standard view of Old Harry Rocks in Dorset, taken by countless photographers before. Without having to move very far, however, a less photographed viewpoint was found and more dramatic image was achieved.



Foreground interest

Swot up on how you should use foreground interest to give your shots depth and scale and improve the impact of your images

THE LATE, GREAT war photographer Robert Capa once said, "If a picture's not good enough, you weren't close enough."

He was talking about capturing the drama of human conflict, of course, and the need to be in the heart of the action – an approach that unfortunately eventually cost him his life. However, the same maxim can easily be applied to landscape photography because if you want to capture the drama of a great scene, you need to move in close and make the most of the foreground – it's one of the important elements you need to create a dynamic composition.

Foreground interest is useful for a number of reasons. First and foremost, emphasising the foreground will help to give your photographs a sense of distance and scale. This is due to perspective – features close to the camera look much bigger than those further away, so our brains immediately register that the smaller features must be in the distance and we see the image as three-dimensional, making it more realistic.

Second, the foreground provides a convenient entry point into the composition for the viewer's eye, which then naturally travels up through the scene to the focal point or the background. A successful composition needs a 'hook' to entice the viewer and hold the attention. With landscapes, the foreground is that hook.

Third, the foreground contains more information than the rest of the scene, and being closest to the camera allows you to record the fine detail that isn't affected by haze, mist and fog, like features that are more distant.

Wide-angle lenses are the most useful for exploiting foreground interest as they allow you to include elements in a shot that are literally at your feet. The way wide-angle lenses 'stretch' perspective also makes those elements loom large in the frame while

everything else seems to rush away into the distance. The lower the viewpoint you adopt, the more the foreground will dominate.

Lenses with a focal length of 16–18mm (24–28mm on full-frame sensors) are a relatively safe bet to begin with as they're wide enough to include lots of foreground interest without being so wide that you end up with all foreground and nothing else. Once your confidence grows, you can produce amazing images with ultra wide-angle lenses from 10–15mm (15–22mm full-frame), but you need to get really close to the foreground, otherwise it will seem miles away due to the excessive 'stretching' of perspective that you get with these wider lenses.

Telephoto lenses are less dynamic in this respect, as the foreground interest you include is formed by elements or features in the scene that are obviously further away, while the foreshortening of perspective 'squeezes' the elements together so that you don't get the same sense of distance and three-dimension as with a wide-angle. Nevertheless, the effect can still be strong, with a single feature dominating the foreground.

What can be used as foreground interest? Pretty much anything – rocks, rivers, walls, gates, fences, trees, moored boats, sand ripples, reflections, people. Features and elements in the scene that create natural or assumed lines work the best of all, as they lead the viewer's eye into and through the scene. Lines that travel vertically work well, lines that travel diagonally from bottom left to top right work even better, and lines that converge into the distance, such as railway tracks or straight roads, are the most powerful of all. To make the most of vertical and converging lines, turn your camera on its side and shoot in portrait format. Diagonal lines are better shot in landscape format as they have further to travel through the composition, holding attention for longer.



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1) Use a wide-angle lens to 'stretch' perspective and a low viewpoint to make the foreground interest more prominent.

2) Try picking subjects that form diagonal lines leading from the bottom left to the top right of the frame, like these boats do, as it draws the viewer into the picture.

3) Instead of using foreground interest as a prelude to a distant focal point, try composing pictures where the dominant subject is in the foreground and keep the background simple.

4) One good reason why you shouldn't leave home without an array of ND grad filters is to ensure your foreground is correctly exposed. In low-light conditions, like a sunset, it's easy to render the foreground dark and distracting.

5) Practically anything can work as foreground interest, as long as it's composed well and fits with the rest of the scene. Look for unusual subjects or for objects that you may never have considered using before, such as driftwood, shells or wreckage remains.

6) Rocks are one of the most popular subjects to use in a coastal landscape and can also be the most effective when used as a lead-in line. Jetties and piers work well, too, and have the added bonus of you being able to introduce converging verticals.





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Maximise depth-of-field

There's no point including fantastic foreground if it's out of focus; what you need is enough depth-of-field for front-to-back sharpness. As a rule of thumb, if you use a camera with an APS-C sensor with a focal length around 16-18mm, focus the lens on a point 1.5m from the camera, stop down to f/11 and everything will be sharp from around 75cm to infinity. For wider focal lengths in the 10-15mm range, focus on a point one metre away, stop down to f/11 and everything will be sharp from around 50cm to infinity. For full-frame DSLRs with a focal length in the 24-28mm range, focus on a point 1.5m away, stop down to f/16 and depth-of-field will extend from around 75cm to infinity. For wider lenses in the 16-20mm range, focus on 1m, stop down to f/16 and you'll get depth-of-field from around 50cm to infinity. Basically, to maximise depth-of-field with wide-angle lenses, you need to focus on a point relatively close to the camera; many photographers focus further into the scene, resulting in an unsharp image.

Lead-in lines

Master one of the most important compositional tools: lead-in lines

FEW COMPOSITIONAL DEVICES can improve the impact of, and add depth to, your landscape pictures as well as lead-in lines.

When you think of lead-in lines, what comes to mind? Rows of crops, a seemingly never-ending road, a meandering stream? What about shadows, footprints, clouds, the coastline, windows, piers, cracks, paths or rocks? The list can go on and on. Although lead-in lines come in many guises, some natural, others man-made, all of them tend to either lead the viewer in and out of the picture or towards a focal point. The latter being the preferred choice as it allows the eye to settle within the scene, but both can work well depending on the picture.

Some of the most effective lead-in lines start from the bottom edge of the frame and go straight in to the centre of the picture, like a pier towards the horizon, but there are many variations that can have just as much impact, depending on the scene. While straight lines quickly draw the eye to the point of interest, curved lines force the viewer to take a more leisurely journey through the image. Vertical lines, shot from a low angle, like those on a building, add tension to a picture and diagonal lines work well if they travel from the bottom left to the top right of a picture, as that's where the human eye naturally gravitates. It doesn't have to be a single line either: multiple lines only strengthen the effect of one line, as long as they're clearly defined and heading in the same direction. It's very important to try to keep the elements within a scene connected,



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as any break in the flow of the line will leave the composition feeling disjointed and allow the viewer's gaze to wander aimlessly in and out the frame.

You can enhance your lead-in lines depending on what viewpoint and lens you choose, as both can either flatten or stretch perspective. The most dynamic distortion of lead-in lines is converging verticals. Converging diagonal lines create a powerful impression of distance and depth, especially if they converge in to the centre of the frame and run parallel to each other. By standing in the middle of them, you'll find that the further the lines are away from the camera, the closer they get to each other, creating what's known as a vanishing point when they join. A wide-angle lens can greatly enhance this effect as it stretches perspective – so the lines seem wider at the start and narrower in the distance – whereas a telephoto lens compresses perspective and hinders the feeling of depth.

1) Lead-in lines don't have to be straight or lead to a focal point: the line can also be the interest in the picture. Note how your eye is led through the scene by the wintry tree-lined road.

2) When using converging verticals, you need to get the entire scene in focus. Set the camera up on a tripod and select a small aperture (f/11 to f/22) and focus on the hyperfocal distance for maximum depth-of-field.

3) Simple compositions can sometimes be the most effective. Think about creating a graphic coastal landscape with nothing more than groynes or a pier as a lead-in line. By connecting it to the horizon, too, it means the viewer's gaze is led in to the far reaches of the scene and led out of the frame by the horizon line.

4) Diagonal lines can be used to draw the gaze from bottom left to top right, where the eye naturally gravitates, as in this coastal landscape where the lines of rocks converge towards the stunning sunset sky.

5) The fence in this picture is used as a neat device to draw the eye in towards the focal point: the elevated castle in the distance.



HELEN DIXON



ROSS HODDINOTT



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Lead-in lines: Think differently

Try photographing lead-in lines from different angles. You may find that photographing the lines entering the frame at an angle work better than if you captured them starting within the frame. The opposite can be true, too. Try different perspectives: get low to the ground for extreme converging verticals. Tilt the camera up to see what vertical lines you can find and try to elevate your position by standing on a bridge, for instance. Above all, keep your eyes and your mind open for less obvious linear aspects and don't forget the other guidelines for composition, including foreground interest and the rule-of-thirds.



HELEN DIXON



HELEN DIXON



LEE FROST



How to use natural frames

For ideas, inspiration and information on how to improve your landscape pictures by using environmental frames, read on...

ONE OF THE MOST effective ways to produce a tight, structured composition is by framing the scene or subject you're shooting. Not only does this help to direct the viewer's eye towards the most important part of the picture, but frames can also be used to hide uninteresting areas, such as a broad expanse of empty sky. Natural frames can be used in all types of photography, but abound in the landscape if you keep your eyes peeled.

When you think of natural frames, what comes to mind? The overhanging branches of a tree are perhaps the most obvious. The gap between trees that frames the scene beyond? How about overhanging cliffs or the entrance to a cave? On the coast, the gaps between rock outcrops or cliffs can be used to frame the beach and sea beyond.

These are all fairly obvious options, but if you start to think laterally, other ideas will present themselves. For example, the shape of a hillside or mountain can be used to frame features positioned in front of it. Clouds in the sky can act like a frame, too – containing elements on the ground and forcing the eye down towards them.

When shooting using a frame and the sun is behind you, light will fall onto the entire scene, so everything will be of a similar brightness and should record more or less as you see it.

If you're shooting into the light, however, or the sun is to the side of the camera's position, the main part of the scene may be well lit, but little or no light will fall directly onto the frame and it will record dark or even as a silhouette. If the frame and the scene beyond it is evenly lit, you shouldn't experience any problems obtaining well-exposed images. If you're standing in the shadow of the frame, however, overexposure is likely. If this proves to be the case, step beyond the frame and out of the shade, take an exposure reading, set it on your camera using the AE-Lock or by shooting in manual exposure mode, and don't change anything once you recompose with the frame included. Alternatively, take a shot from your shooting position, check the preview image and histogram, then apply negative or positive exposure compensation as required and retake your exposure.

Finally, if you want the frame and the scene beyond to be rendered in focus, select a small lens aperture, such as f/13, and use hyperfocal focusing to maximise depth-of-field. Alternatively, by setting a wide aperture such as f/4 and focusing on the scene beyond the frame, depth-of-field will be reduced so that the frame itself is thrown out of focus and all attention is directed towards your main subject.

Wide-angle or telephoto?

The effect the frame has on the composition is partly determined by your lens choice. Wide-angle lenses stretch perspective so the apparent distance between the elements in a scene is increased. If you move close to a natural frame, you can include it in the shot, but you'll still get a clear view of the scene beyond. Telephoto lenses have the opposite effect – they compress perspective so the elements in a scene appear closer together. This makes them less suited to shooting natural frames, though they can be handy at times if you're unable to get close to an effective frame and you're happy for the scene beyond the frame to be more selective.



ISTOCK PHOTO



ISTOCK PHOTO



LEEFROST



LEEFROST



LEEFROST

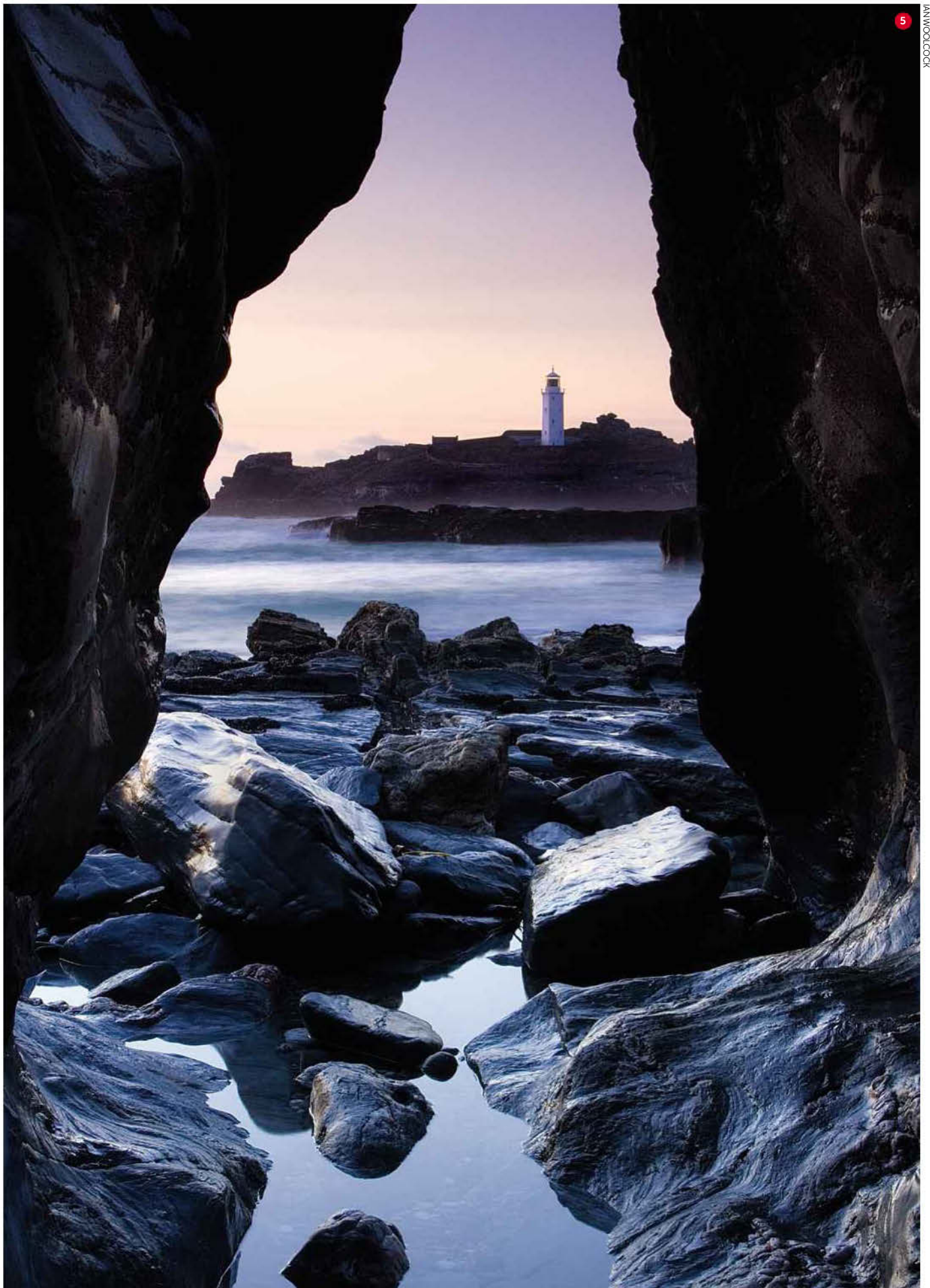
1) Using archways is something we've seen many times before, but they always lend themselves beautifully to frame a focal point. It works particularly well with this church because the detail in the frame complements the subject.

2) Think about symmetry when looking for natural frames; it is always pleasing to the eye. Even the most simple of arrangements can create impact, as seen here.

3) Using natural frames is a great way of adding foreground interest to a scene. While the castle is the focal point in this image, it's the dramatic spikes that add impact for the viewer.

4) Your subject doesn't have to fill the frame to be striking – here the extra space helps to frame and draw emphasis to the small chapel. Try using subtle but graphic shapes in the landscape, such as clouds or hills, to improve your composition – simply centring the church would fail to create the same energy as it does here. Think outside the box and you'll begin to see frames in the most unlikely places.

5) The dark frame here is a striking contrast to the lighter scene beyond. Look for differences in colour to emphasise your frame and add impact.



Sharpness

IMAGE QUALITY IS of utmost importance in classic landscape photography, which is why some practitioners use expensive medium-format digital cameras or even large-format film cameras. The bigger the original, the better the quality.

Not that you should start listing your DSLRs on eBay – the quality of enthusiast-level DSLRs is more than good enough – but if you want to get the best from your camera and produce landscapes of optimum quality, you should follow a few simple guidelines.

Common-sense stuff first. Keep your lenses and filters clean – muck, scratches and greasy finger marks all degrade image quality. Check your sensor regularly too, especially if you find you need to clone out lots of spots from your images.

If you're handholding the camera, watch the shutter speed – once it drops to 1/60sec or below you're in the camera-shake danger zone. You could increase the ISO rating and set a faster shutter speed but the higher the ISO, the more image quality will be affected so keep it to ISO 100 or 200 and mount your camera on a tripod instead if the shutter speeds are getting too slow. Many landscapers never take a shot without the camera clamped to a sturdy tripod.

How and where you focus is important. To maximise depth-of-field (which we'll

come to in a moment), you need to control where the lens is focused, and that's much easier to do if you are to focus manually as you can mount your camera on a tripod, compose the shot then focus the lens on a specific distance.

If you do that using AF you'll either have to select a focus point that hits the right spot, or focus with the central AF point, lock focus and recompose – all rather fiddly compared to focusing manually. You also don't have to worry about the focus shifting and you can leave the camera in position ready while you wait for the right light.

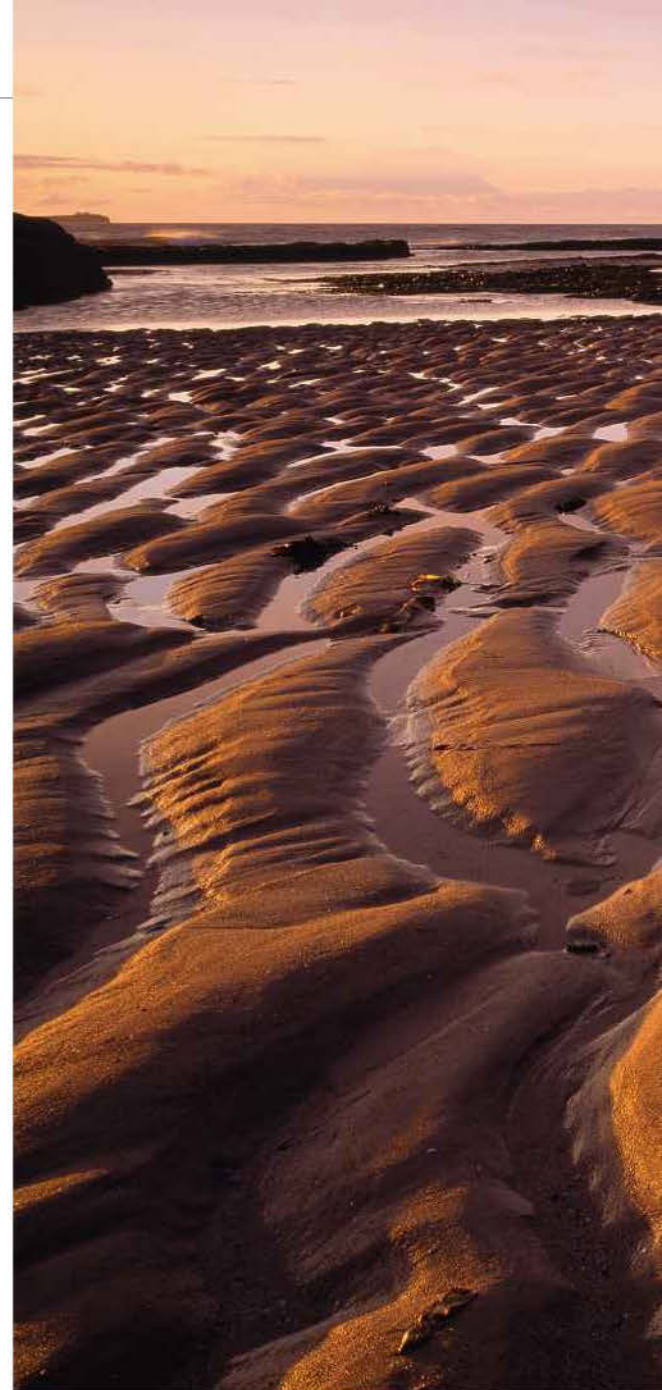
Of course, the biggest factor that determines the quality of a landscape image is whether or not there's enough depth-of-field to record the scene in sharp focus from front-to-back. If the foreground is slightly soft, or distant features, you'll kick yourself, so make sure you're au fait with controlling and maximising depth-of-field.

Stopping your lens down to f/22 and focusing on infinity may seem like a simple solution, and with wide-angle lenses it'll often give you front-to-back sharpness. Unfortunately, at minimum aperture lenses suffer from diffraction, reducing image quality. Optimum quality is usually achieved at f/8 or f/11. Also, you may not get front-to-back sharpness using this method, so image

HYPERFOCAL DISTANCE FOR FULL-FRAME/35MM SLRS										
	16mm	20mm	24mm	28mm	35mm	50mm	100mm	135mm	200mm	300mm
f/2.8	3.2m	5.0m	7.0m	10m	15m	31m	123m	225m	495m	1110m
f/4	2.2m	3.5m	5.0m	7.0m	10.5m	21.5m	87m	157m	345m	775m
f/5.6	1.6m	2.5m	3.6m	5.0m	7.5m	15.5m	62m	112m	245m	555m
f/8	1.1m	1.7m	2.5m	3.5m	5.5m	11m	43m	79m	173m	388m
f/11	0.8m	1.3m	1.8m	2.5m	4.0m	8.0m	31m	57m	125m	282m
f/16	0.6m	0.9m	1.3m	1.7m	2.7m	5.5m	22m	39m	86m	195m
f/22	0.4m	0.6m	0.9m	1.3m	2.0m	4.0m	16m	29m	65m	140m
f/32	0.3m	0.5m	0.6m	0.9m	1.4m	2.7m	11m	20m	43m	97m

HYPERFOCAL DISTANCE FOR DIGITAL SLRS WITH A CROP FACTOR OF 1.5X (NIKON, SONY, PENTAX)										
	16mm	20mm	24mm	28mm	35mm	50mm	100mm	135mm	200mm	300mm
f/2.8	5.0m	7.5m	11m	14m	23m	47m	188m	345m	750m	1690m
f/4	3.4m	5.3m	7.5m	10.5m	16m	33m	132m	240m	525m	1185m
f/5.6	2.4m	3.8m	5.5m	7.5m	11.5m	23.5m	94m	170m	375m	845m
f/8	1.7m	2.7m	3.8m	5.2m	8.0m	16.5m	66m	120m	265m	590m
f/11	1.2m	1.9m	2.3m	3.8m	5.9m	12.0m	48m	87m	192m	430m
f/16	0.9m	1.3m	1.9m	2.5m	4.0m	8.5m	33m	60m	132m	295m
f/22	0.6m	1.0m	1.4m	1.9m	3.0m	6.0m	24m	44m	96m	215m
f/32	0.4m	0.7m	1.0m	1.3m	2.0m	4.2m	16.5m	30m	66m	150m

HYPERFOCAL DISTANCE FOR DIGITAL SLRS WITH A CROP FACTOR OF 1.6X (CANON)										
	16mm	20mm	24mm	28mm	35mm	50mm	100mm	135mm	200mm	300mm
f/2.8	5.0m	8.0m	11.5m	15.5m	24.5m	50m	199m	360m	795m	1785m
f/4	3.6m	5.6m	8.0m	11m	17m	35m	140m	255m	555m	1250m
f/5.6	2.6m	4.0m	5.7m	7.8m	12m	25m	99m	180m	397m	895m
f/8	1.8m	2.8m	4.0m	5.5m	8.5m	17.5m	69.5m	127m	278m	625m
f/11	1.3m	2.0m	2.9m	4.0m	6.2m	13m	50m	92m	202m	455m
f/16	0.9m	1.4m	2.0m	2.8m	4.3m	8.7m	35m	63m	139m	312m
f/22	0.7m	1.0m	1.5m	2.0m	3.0m	6.5m	25.5m	46m	101m	230m
f/32	0.5m	0.7m	1.0m	1.4m	2.2m	4.4m	17.5m	32m	70m	156m



sharpness is compromised on two counts. The solution is to use good old hyperfocal focusing, a simple technique that allows you to maximise depth-of-field for a particular scene but also avoid stopping down the lens aperture more than you need to. Result? Front-to-back sharpness and optimum optical quality from your lenses.

Hyperfocal focusing involves focusing the lens on a specific distance for a particular focal length and aperture (f/number). If you use manual focus prime lenses, you can use the depth-of-field scale marked on the barrel to find the hyperfocal distance. But if you use autofocus zooms you'll need to rely on hyperfocal tables like those to the left.

To use these tables, first choose the right table for your camera, then find the focal length you're using and the aperture (f/stop) you want to use, then read across to find the hyperfocal distance. By focusing on that distance, depth-of-field will extend from half that distance to infinity. For example, if you're using a Canon DSLR with a zoom at 28mm



Above: Working out the correct hyperfocal distance allows you front-to-back sharpness. Right: Getting your focus spot on is key for scenes that are packed with detail.

and stopped down to $f/11$, the hyperfocal distance is 4m. By focusing the lens on 4m, depth-of-field will extend from 2m to infinity.

If you're not sure how much depth-of-field you need, focus on the nearest point in your scene and check the distance scale on the lens barrel to see how far away it is. You can then refer to the hyperfocal distance table to find out which aperture you need to use to achieve sufficient depth-of-field. For example, if the nearest point in the scene is 3m away and you're shooting at 35mm on a full-frame DSLR, you need to use the aperture that will give you a hyperfocal distance of 6m because if you focus on 6m, depth-of-field will extend from 3m (half the hyperfocal distance) to infinity. In this case, $f/8$ is closest, with a hyperfocal distance of 5.5m (which gives you depth-of-field from 2.75m to infinity).



FILTERS

Lee Frost reveals the importance of filters for landscape photographers

IMAGINE YOU'RE ABOUT to be shipwrecked on a desert island and the captain of the vessel has given strict instructions that you can only take three filters overboard with you. Okay, so it's a rather extreme scenario, but – hey – worse things have happened at sea! The question is, which three would you take?

As a child of the Cokin era, I managed to amass more filters than your average camera shop. I had bits of plastic (okay, okay, C39 resin) that could add fake rainbows to my images, ruin a perfectly nice sky by turning it tobacco, reduce attractive scenes to impressionistic smudges, turn bright points of light into brilliant explosions of colour, and perform all sorts of other weird and wonderful tricks. I never used the things, of course, because most of the effects were horrible. But you weren't a proper photographer unless you carried at least a dozen of them everywhere, and if the worst came to the worst, they were ideal for making a sow's ear from a silk purse. I've got hundred of examples to prove it.

Fortunately, after numerous failed attempts I managed to kick my Cokin addiction, so out went all the filters that weren't essential – which actually left very few. Later still, I jumped on the digital bandwagon, which meant I could jettison even more (mainly the colour correction and conversion filters that have been replaced by White Balance and colour temperature adjustments).

Today I'm left with only three filter types: Neutral Density (ND) grads, a polariser and solid Neutral Density (ND) filters. For landscape and general photography, they're all you need, and all three can be used individually or in combination to help you get the most from a scene.

Some of you may be thinking, 'Why bother with filters at all when the effects can be added in Photoshop?' Well, if you're thinking that, chances are you've never used them, because while the effects some filters have can be replicated in Photoshop, others can't. And anyway, even if they could all be, surely it's better to get your photographs as close to completion in-camera as possible, rather than spending ages at your computer trying to sort them out in post-production?

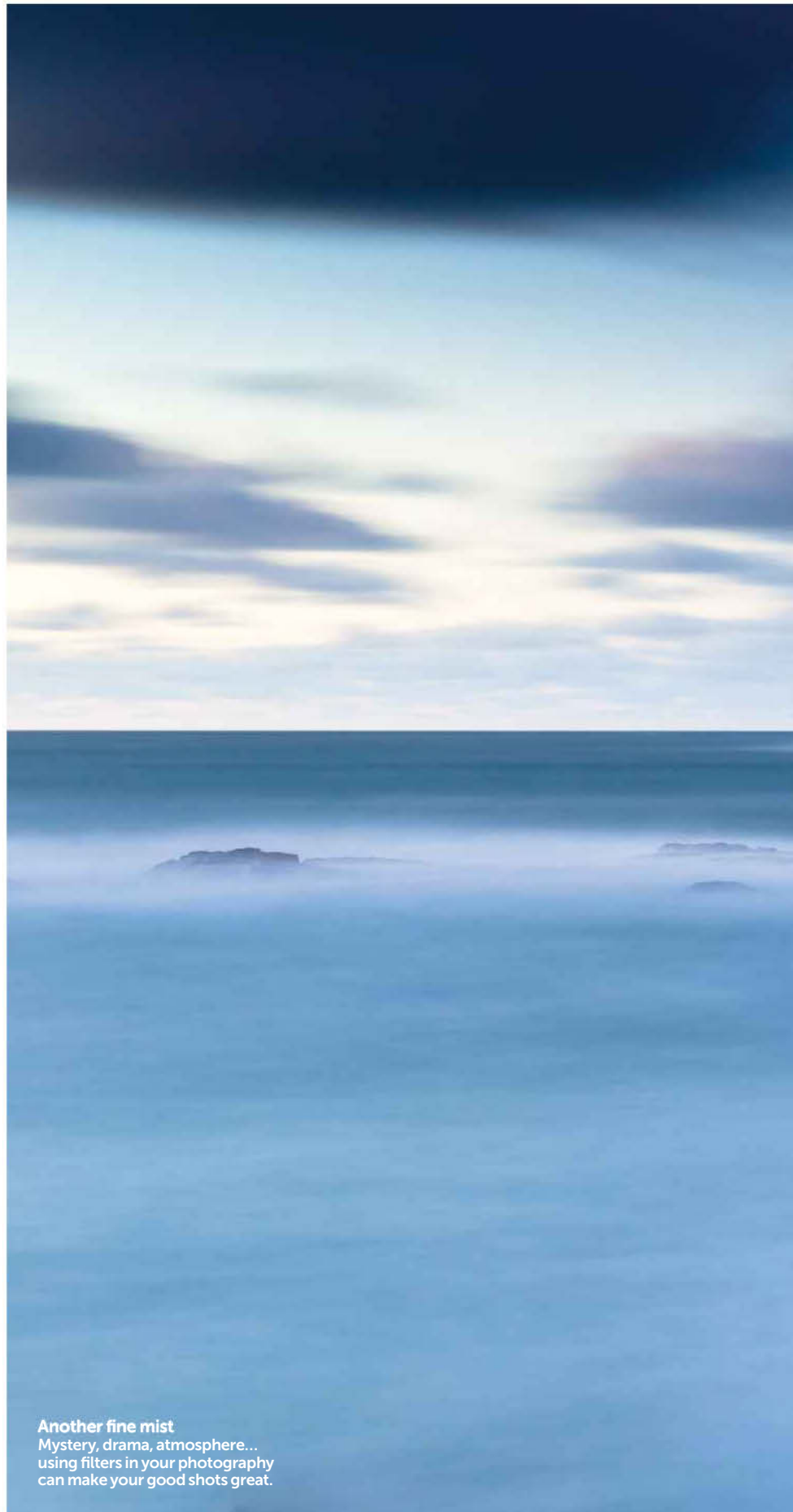
For information on filter systems, take a look at the panel below, then read on to see the difference my three favourite filters could make to your landscape images.

Which filter system?

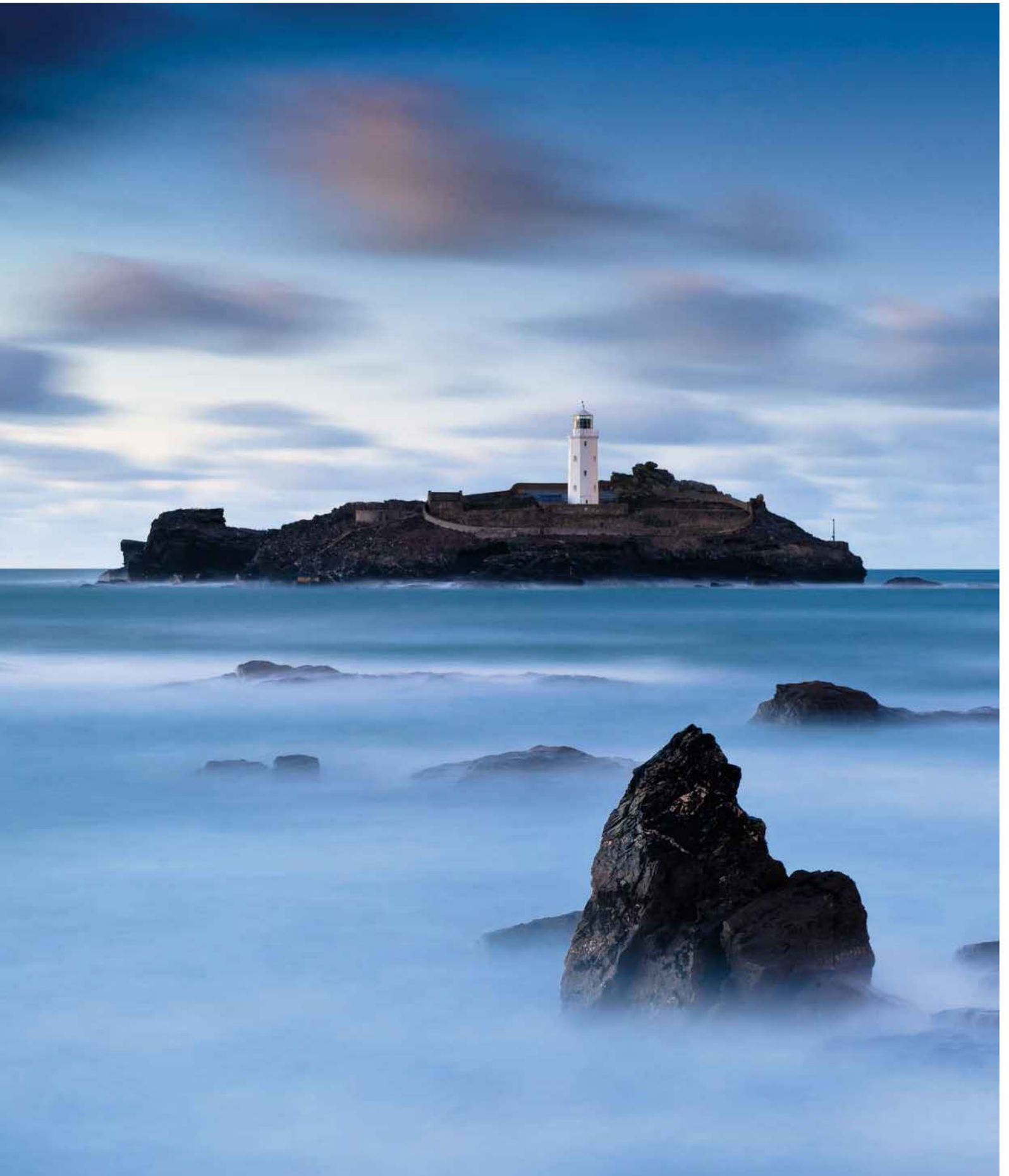
● **SCREW-IN:** These high-quality filters screw directly onto the filter thread of your lens, making them fast and easy to use. You'll find numerous polarisers and ND screw-in filters (including B+W's ten-stop ND) but virtually no ND grads. While offering excellent optical quality, screw-in filters have one big disadvantage: if you have numerous lenses, you'll most likely need to buy several sizes of screw-in filters. Brands to consider include B+W, Hoya and Tiffen.



● **SLOT-IN:** Your best choice when investing in a filter system is the slot-in variety. You buy rings that screw on to your lenses and a holder that slips on to these rings – this way you only need one filter. Polarisers, NDs and ND grads are all available as slot-in filters. Cokin (P or X-Pro) and Formatt (Hitech) are good first systems, while Lee Filters is the professionals' choice.



Another fine mist
Mystery, drama, atmosphere...
using filters in your photography
can make your good shots great.



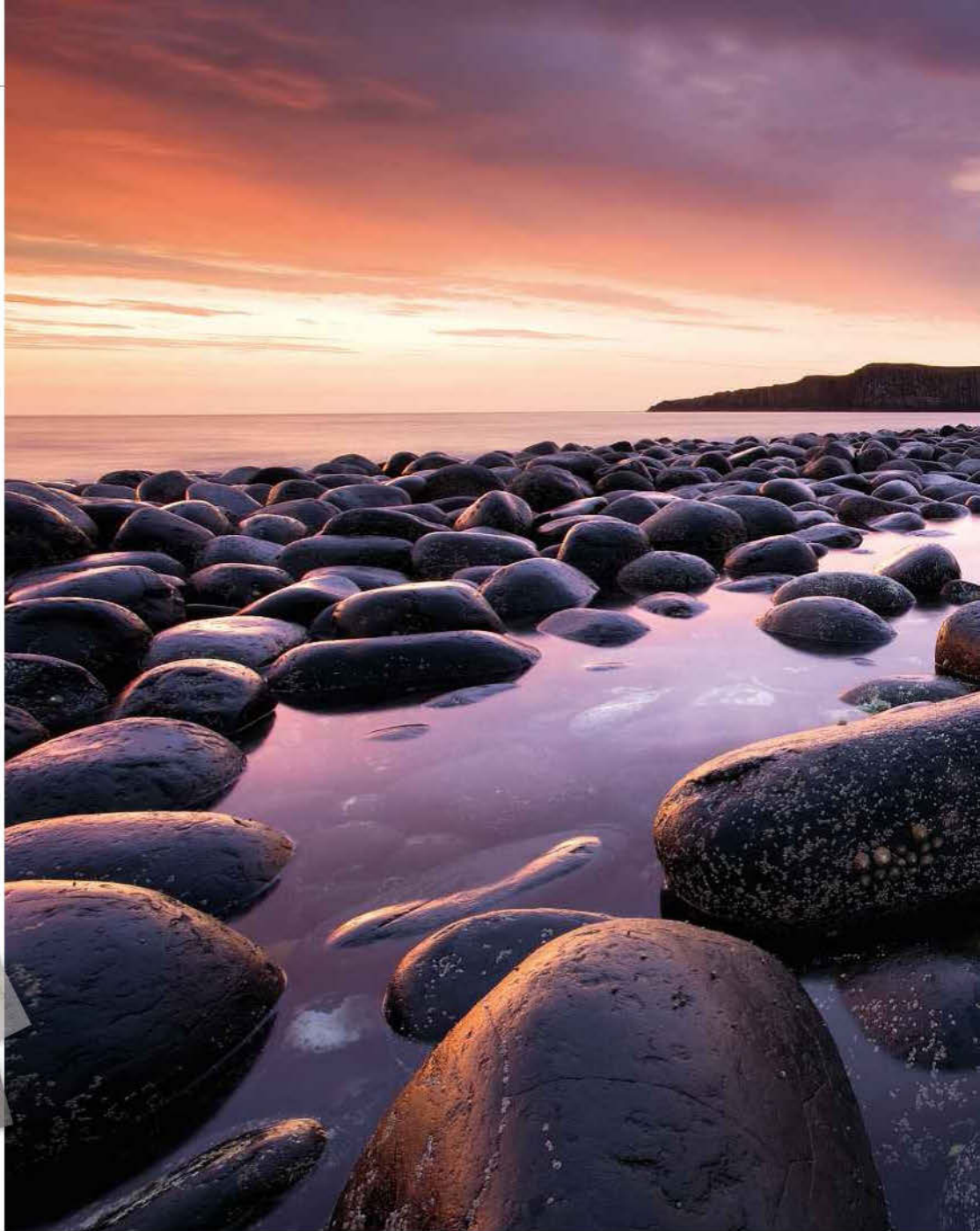
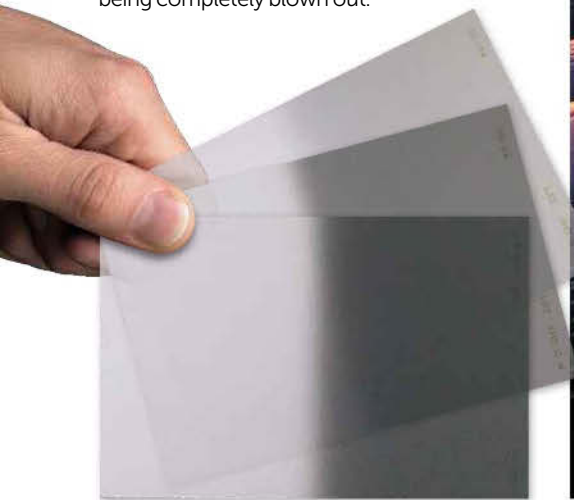
ND graduates

Make bland skies a thing of the past by learning how to use a Neutral Density graduate filter

HOW MANY TIMES have you composed a great shot with a dramatic sky only to discover that when you check the picture you've taken the landscape looks fine, but the sky is overexposed and washed out?

Naive photographers shrug their shoulders and think, 'Oh, I'll rescue that later' – which is fine if there's something to rescue. But if the sky's so overexposed that no detail has been recorded, there won't be. More experienced shooters take two photographs of the scene – one exposing for the sky, the other for the landscape – then combine them in Photoshop. This method works well, but does mean more time in front of a computer than a camera. The quickest and easiest solution is to use an ND grad filter.

ND grads are grey on the top half – that's the Neutral Density part – and clear on the bottom half. The idea is that the grey part of the grad tones down the brightness of the sky so that when you expose for the landscape, the sky is also correctly exposed, instead of being completely blown out.



ND grads & exposure

Before multi-zone metering was introduced, exposure readings had to be taken with a lightmeter and set manually on the camera before attaching an ND grad to the lens in order to avoid getting an overexposed image. Metering systems these days are much more intelligent; now you can compose your shot, align the grad ready for use and meter with it on the lens. The reason for this is that a multi-zone metering pattern takes a number of exposure readings from different parts of the image area, therefore the darkness of the filter doesn't influence the final exposure in a negative way. In fact, it helps your camera obtain an accurate reading, as when an ND grad is fitted, the Neutral Density part of the filter darkens the sky area so that the contrast between the sky and foreground is reduced. Hey presto: a perfectly exposed landscape.

Choose the right density

To produce a convincing result you need to choose the right density of ND grad. Fortunately, making the right choice isn't difficult as there are only three main densities to choose from: 0.3, 0.6 and 0.9, which reduce the brightness of the sky by one, two and three stops respectively. Some manufacturers also produce a 1.2ND grad, which tones down the sky by four stops. The weakest, 0.3ND, is only of use when you need a very subtle effect, while the stronger 0.9ND is mainly used at dawn and dusk when the sky's really bright but there's no direct light on the landscape. That just leaves the 0.6ND grad, which is the best choice for general use. If in doubt, take a test shot with a 0.6ND grad, check the image on your camera's preview screen, then switch to either a 0.3ND or, more likely, a 0.9ND if the effect isn't right.



Aligning an ND grad

The key to success with a grad is correct alignment, so it does its job without leaving telltale signs. Many photographers struggle and assume there must be a magic formula, but it's just a case of taking your time.

1 Slide the filter

Mount your camera on a tripod and compose the frame. Next, place an ND grad filter in the filter holder on your lens, and while peering through the viewfinder, slowly push the grad down into the holder.



2 Watch carefully

As you slide the grad down you should see the top part of the picture appear to get darker. It won't be obvious, even if you're using a strong ND grad, so watch carefully and when you think you've got the ND grad in the right position, stop moving it down.



3 Don't go too far

A common mistake is to push the grad too far into the holder. The grad will then act like a solid ND filter and increase the exposure but it won't balance the difference in light between the sky and foreground. You may also see the line of the grad.



4 Use LiveView

If you struggle to align the grad using the viewfinder, try using LiveView. You may find it simpler to do this as you're seeing the exact effect the filter is having on the image, making it easier to accurately align it.



Reach for the sky
Experienced landscape photographers consider an ND graduate an essential item and not an optional accessory.

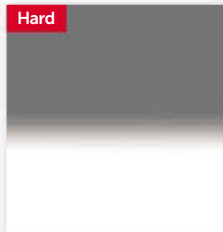
Hard or soft grads?

There are two types of ND grad: hard and soft. This refers to the way in which the Neutral Density (grey) part of the filter graduates down to clear: with hard grads the change is quite sudden; whereas with soft grads it's gentle. Newcomers to ND grads assume that soft grads are easier to use because if you align them incorrectly it's less likely that you'll see the line of the grad in your picture. However, hard grads are also quite forgiving and give a more defined effect, making them the best choice.

Soft



Hard



Soft



Hard

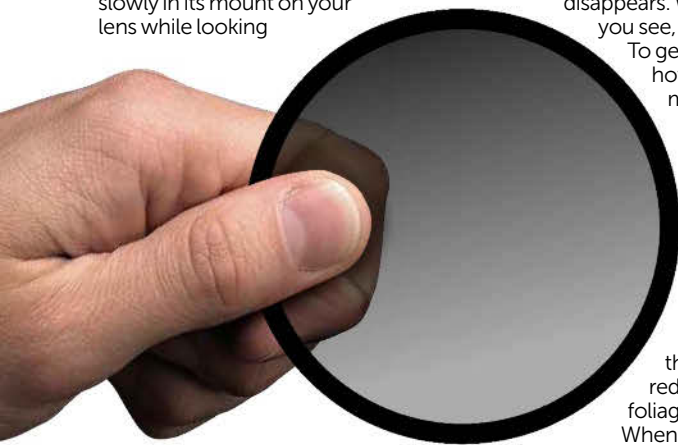
Polariser

A circular polariser will be your best friend, boosting colour impact and reducing reflections

WHEN LIGHT STRIKES a surface, some of the rays scatter in all directions thus becoming polarised, causing reflections and glare that reduce colour saturation – particularly on shiny surfaces such as paintwork and foliage. Polarising filters prevent this from happening by only allowing light rays to enter your lens that are travelling from one direction – effectively blocking out polarised light. Doing this offers three distinct advantages for landscape photography.

The most obvious benefit is that the blue of a sky is deepened because it contains a lot of polarised light. Using a polariser allows you to add visual impact to images by providing a strong, punchy blue backdrop. Another benefit is that glare on non-metallic surfaces is reduced, so the colours in a scene appear richer and more saturated. The third advantage to using polarisers is that reflections are eliminated, so you can see through windows and into rivers.

Using a polariser is easy because you can see the effect it has simply by rotating it slowly in its mount on your lens while looking



through the camera's viewfinder. Blue sky goes darker and white clouds stand out, reflections come and go, and glare disappears. When you're happy with what you see, simply stop rotating and fire.

To get the best possible results, however, you should also bear in mind certain factors.

Although polarisers generally work best in bright, sunny weather when there's more polarised light around, they can be used in dull, overcast conditions, too, in order to remove glare and reflections. Autumnal woodland scenes usually look much better if you shoot them through a polariser, as glare is reduced, so the rich colours of the foliage really come through.

When using a polariser to deepen blue sky, keep the sun at a right angle to the camera so you're aiming towards the area of sky where maximum polarisation occurs. That way, you'll get the strongest effect. If the sun is behind you, or you're shooting into the sun, a polariser won't make much difference. Polarisation in the sky also tends to be better when the sun is low in the sky – so early morning and evening give better results than in the middle of the day.

Polarisation is uneven across the sky, so take care when using ultra wide-angle lenses or zooms with a focal length wider



Circular or linear?

There are two types of polarising filters available: linear and circular. Avoid linear. You need to use a circular polariser with your digital camera as linear polarisers are used on certain older manual focus film SLRs. Both types do exactly the same job, but a circular polariser is manufactured differently to ensure correct exposure when used with autofocus DSLRs and CSCs.

than 24mm (15mm on APS-C sensors) as the sky in your images may record darker on one side than the other: the effect can look very odd. This can be corrected in Photoshop later, but it's tricky. You should also note that glare will only be removed from non-metallic surfaces such as paintwork, foliage and plastic. To remove reflections from surfaces such as water and glass, the angle between the reflective surface and the lens axis must be around 30°. You can find this by making slight adjustments to your position then rotating the polariser to see what happens.

Finally, polarising filters can give your pictures a slight blue colour cast when used in bright, sunny weather. To remove this, either adjust your camera's White Balance setting or correct the cast when you process the Raw file on your computer.

Polarisers & exposure

When you use a polariser, it reduces the light entering your lens by two stops. This means if you have an exposure of 1/125sec at f/11 without a polarising filter in place, the exposure would drop to 1/30sec at f/11 once you fitted it. Your camera accounts for this light loss automatically, so you don't need to compensate, but you need to be aware of it because the shutter speed can easily become very slow when using a polariser – even in bright sunlight – so the risk of camera shake is increased. That said, this light loss can be a benefit when you want to use a slower shutter speed, as the polariser acts like a two-stop (0.6 ND filter (covered overleaf). When shooting waterfalls, for example, the polariser not only gives you a slower shutter speed to blur the water, but also removes reflections from water and glare from wet rocks and foliage, giving a better result.

Blue sky thinking
Beef up your blue sky and
add visual impact to scenics
by using a polarising filter.

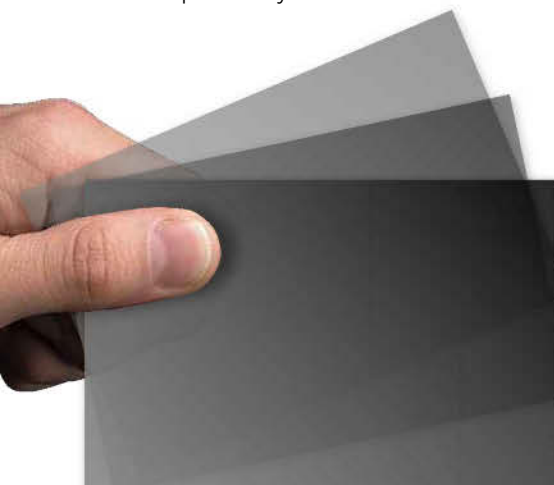


Neutral Density (ND) filters

Lengthening exposure times with a Neutral Density filter is one of the simplest ways to be creative with your camera, producing great movement in images

ND FILTERS ARE specially made to reduce the amount of light entering your lens without changing the colour balance – hence the name Neutral Density. They do a similar job to ND grad filters, but instead of affecting just part of the image (usually the sky with ND grads), they have a uniform effect on the whole image.

ND filters are mainly used to increase the exposure required for an image, so you can use a slower shutter speed to record motion. The classic subject that they're used for is waterfalls, recording the moving water as a graceful blur. But they can be used to introduce or increase motion in all kinds of subjects – crowds of commuters pouring off a train, traffic moving along busy roads, trees blowing in the wind, waves washing over rocks and so on. They're ideal for use in bright conditions when the lowest ISO rating and smallest aperture aren't enough to give you the slow shutter speed that you desire.



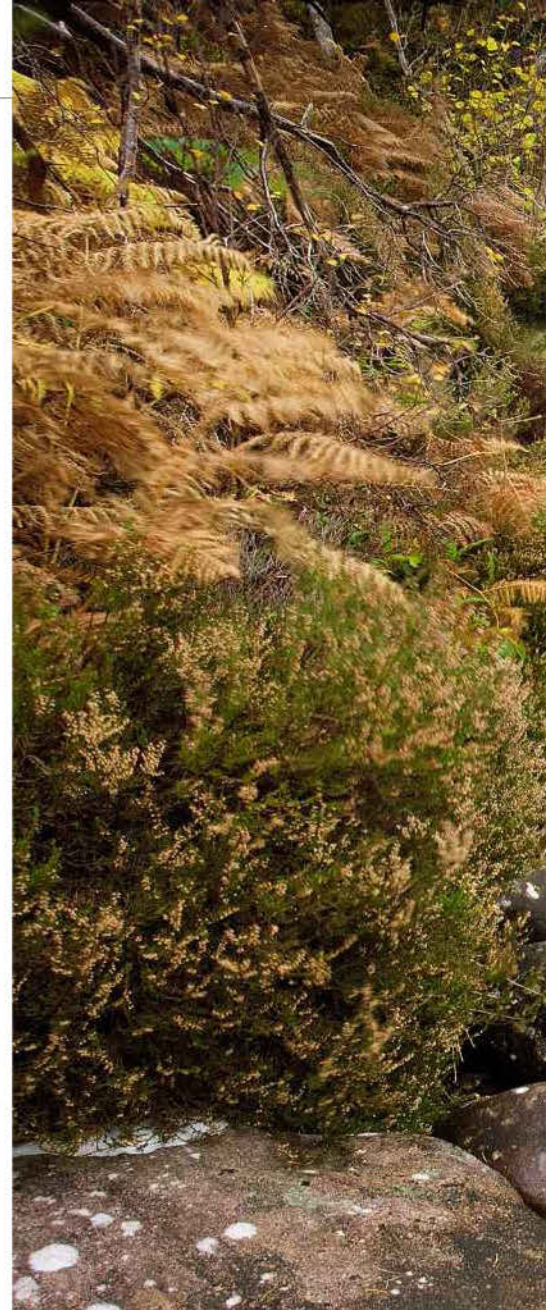
Exposure chart

If you're using weaker ND filters, up to a 1.2 density, your camera's TTL metering will be able to give accurate exposure readings with the filter on the lens. Once density goes beyond 1.2, however, you may find that underexposure occurs because the filter density fools the camera's metering.

To avoid exposure error, take a meter reading without the ND filter on the lens, then calculate the required exposure with it in place and set the exposure on your camera manually. If you have an iPhone, there's a useful app called ND Calc that will do this for you.

Alternatively, refer to the table below. Once the required exposure goes beyond 30 seconds you will have to set your camera to its Bulb (B) mode and time the exposure using the timer on the camera or smartphone, a remote release, your wristwatch or by counting elephants – you decide! We'd recommend that you photocopy and cut out the exposure chart below and keep it along with your ND filter for easy reference.

No filter	With 0.6ND	With 0.9ND	With 1.2ND
1/500sec	1/125sec	1/60sec	1/30sec
1/250sec	1/60sec	1/30sec	1/15sec
1/125sec	1/30sec	1/15sec	1/8sec
1/60sec	1/15sec	1/8sec	1/4sec
1/30sec	1/8sec	1/4sec	1/2sec
1/15sec	1/4sec	1/2sec	One second
1/8sec	1/2sec	One second	Two seconds
1/4sec	One second	Two seconds	Four seconds
1/2sec	Two seconds	Four seconds	Eight seconds
One second	Four seconds	Eight seconds	16 seconds
Two seconds	Eight seconds	16 seconds	32 seconds
Three seconds	16 seconds	32 seconds	One minute
Four seconds	32 seconds	One minute	Two minutes

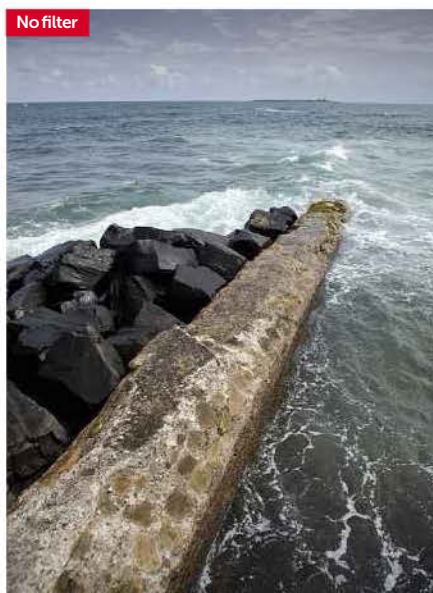


Technique watch!

DIFFERENT DENSITIES

The amount of exposure increase an ND filter requires depends on its density. The weakest ND worth bothering with is a 0.6ND (4x), which requires a two-stop exposure increase. A polariser also requires an exposure increase of two stops so can be used like a 0.6ND filter. Next up is a 0.9ND (8x), which requires a three-stop exposure increase, followed by a 1.2ND (16x) that requires a four-stop increase. This is where the density of conventional ND filters ends, though you can combine two or more for a cumulative effect – a 0.6ND and a 0.9ND together will require a five-stop exposure increase, for example.

The alternative is to use a more extreme ND filter, with a density of 1.8 (six stops) or more. These filters were originally designed for photographing industrial processes that involved extreme brightness but are now popular with photographers as they allow exposures in daylight of several minutes. Turn over for our favourite: the 3.0ND, which requires an exposure increase of ten stops – that's 1000x more than the unfiltered exposure!



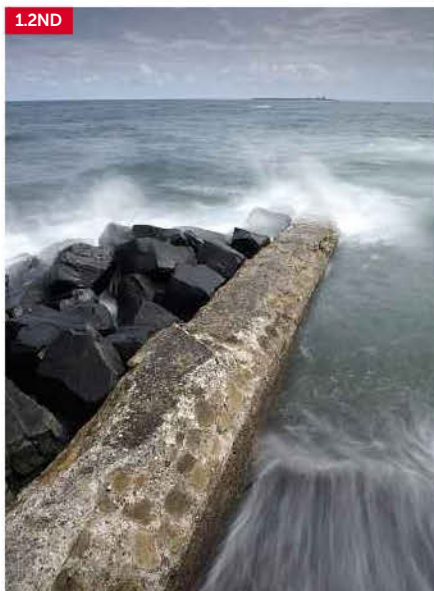


World in motion
Using an ND filter allows you to use longer shutter speeds in daylight: ideal when shooting waterfalls.

ALL IMAGES: LEE FROST

Colour casts

1.2ND



3.0ND



While ND filters should be neutral, once you combine them for higher density (and a longer exposure), you'll see that colour casts appear. This is most noticeable with ten-stop ND filters – the B+W 3.0 adds a very warm colour cast while the Lee Filters Big Stopper adds a cool blue cast. These can enhance the look of the image, but if you prefer, you can adjust the colour temperature when you process the Raw file.

Ten-stop ND filters

Use a ten-stop ND filter and you'll find you can create striking colour and black & white fine-art landscapes with ease

THE FIRST THING YOU'LL notice when using a ten-stop ND filter is that it's so dense, you can't see through it. In bright sunlight you might just make out a faint image through the viewfinder, but its brightness is 1000x less than if you didn't have the ten-stop ND in place. To take a photograph you must therefore mount your camera on a tripod, compose the scene, set focus to manual (as AF won't work through it), align your ND grad in its holder if you're using one, then finally position the ten-stop ND. Most digital SLRs have LiveView that's sensitive enough to see through a ten-stop ND, so if you need to adjust the composition or move the camera and shoot from a different spot, you may be able to do so without taking the ten-stop ND filter off. For most of us, though, removing the filter to see through the viewfinder is unavoidable. That's why a slot-in filter like the Lee Filters Big Stopper or HiTech's Pro Stop is more versatile than the B+W screw-in filter – you can simply remove it from its holder and leave everything else in place, whereas the B+W has to be unscrewed from the lens.

The longest exposure you can achieve using your camera's programmed shutter speed range is 30 seconds. More often than not, you'll be using exposures much longer than that with the ten-stopper, so you'll need to set your camera to Bulb (B) mode in order to keep the shutter open. Trying to keep exposures under 30 seconds for convenience, by opening up the aperture or increasing the ISO rating, is completely defeating the object because you'll get the best effects by using exposures of several minutes.

In terms of subject matter, any scene containing moving elements is ideal. The sky is an obvious candidate: on a windy day, clouds are transformed into ghostly streaks as they drift overhead, and you won't know quite how they're going to record until the exposure ends and you can review the shot. Trees and grass swaying in the breeze also take on a totally different appearance when exposed for several minutes, adding a strong sense of motion to an image.

Coastal scenes are perhaps the most effective subjects for the ten-stop ND. The sea is constantly moving, so over the course of a few minutes, any texture in its surface is lost and it takes on a smooth, milky appearance that contrasts well with static elements such as piers, lighthouses, headlands, jetties and rocks. Clouds work well, too, rendering as streaks in the sky. Or for something completely different, try shooting urban scenes with a ten-stop ND. Anything moving through the scene while the shutter is open – people and traffic mostly – won't record. This means you can capture something that we never see with the naked eye – busy streets completely deserted!

Wide-angle lenses are more effective than telephotos when using a ten-stop ND because you can emphasise the sky and the foreground, which is where most of the motion is recorded. Move in close to a static feature in the foreground and contrast it with moving water, or get down low with a wide lens so you're looking up at the sky.

Bright sunshine gives the least effective light for ten-stop

1/4sec with no filter



Four minutes with a ten-stop



shots as it's harsh and flat, plus the higher light levels mean you won't be able to achieve really long exposures – even with your lens stopped right down and the ISO rating at its minimum setting. Dawn and dusk, on the other hand, are perfect for creating atmospheric images, along with early morning and evening when the sun's low in the sky and the light is warm. The B+W 3.0 ten-stop ND has a warm colour cast, which is ideal for enhancing shots taken at either end of the day. Stormy weather can produce dramatic results, too, as there's more movement in the sky and sea, while on overcast days the soft light and gentle tones result in simple, graphic images.

Although you'll be shooting in colour, ten-stop shots look amazing in black & white – especially if you're not keen on the filter's inherent colour cast. To maximise the impact and drama, when converting your picture to monochrome, treat the sky and the rest of the scene as separate elements by adjusting their tonality separately, using tools such as Levels and Curves. The end result may look nothing like the original scene, but that doesn't matter because as soon as you put a ten-stop ND filter on your lens, you're taking a step back from reality anyway.

Exposure chart

The chart on the right reveals the increase of exposure times when using a ten-stop ND filter. It's a key reason why you're recommended not to use the Long Exposure Noise Reduction system on your camera, as this function takes the same amount of time as the exposure. For instance, when you shoot a two-minute exposure, you'll need to wait another couple of minutes for the image to write and be viewable on the LCD monitor. We'd suggest you switch Noise Reduction off and control noise in post-production.

Unfiltered	3.0ND (Ten-stop)
1/500sec	Two seconds
1/250sec	Four seconds
1/125sec	Eight seconds
1/60sec	16 seconds
1/30sec	32 seconds
1/15sec	One minute
1/8sec	Two minutes
1/4sec	Four minutes
1/2sec	Eight minutes
One second	16 minutes
Two seconds	32 minutes
Three seconds	48 minutes
Four seconds	One hour



Set the mood
The ten-stop ND is the filter
of the moment. Don't
leave home without one.



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THE BASICS OF FLASH

DOES FLASH LEAVE YOU FEELING FLUSTERED? FEAR NOT! WE'VE ENLISTED THE EXPERTISE OF PRO PHOTOGRAPHERS PAUL WARD AND BRETT HARKNESS TO HELP COVER THE BASICS OF SHOOTING GREAT PORTRAITS USING FLASHGUNS. IT'S A LOT EASIER THAN YOU MIGHT THINK AND YOU'LL NOTICE AN INSTANT IMPROVEMENT IN YOUR RESULTS

WE'VE FOCUSED HEAVILY on using daylight in your portraits up until now, but this part of the guide is geared towards getting you started with using flashguns. While in the past flash was expensive and required a fair degree of experience, that's no longer the case. With digital cameras offering users instant review of images, and both cameras and flashguns offering a wealth of features, taking great portraits with flash is now easier than ever! In fact, as you'll discover, we'll be showing you how using flashguns in manual rather than leaving them set to TTL will do wonders for your flash photography. By making changes manually you'll quickly learn the effect that each change makes to your images – it becomes second nature after some practice! What's even better is

that it's no longer the case that you need to invest serious amounts of money to buy top-end flashguns. There are several flash brands out there which offer brilliant models at bargain prices. In fact, for less than £200 you can buy a full flash outfit consisting of two flashguns, a set of wireless flash triggers, softboxes and stands. In other words, for less than the price of a branded flashgun, you can kit yourself out with a wireless flashgun-based portable studio!

So what are you waiting for? Turn over the page and start learning the key basics of flash photography, then head out and buy some kit and try out our simple techniques. You'll be amazed at just how quickly you'll develop your understanding of flash and improve your portrait skills.

The basics of flash photography

The modern flashgun is a portable powerhouse packed with a range of sophisticated functions. Be sure to know how to get the best from it

FLASHGUNS COME IN various shapes and sizes, with some offering a basic specification and low power and others offering a sophisticated range of features and modes as well as a more powerful flash output. Our anatomy diagram below covers the more sophisticated units, using the Nikon Speedlight SB-910 as an example.

Whichever models you use, most operate in a very similar way and are based around the same types of flash modes, as described in the panel below. Most models offer Through The Lens (TTL) flash metering, a sophisticated feature that in most general situations reliably provides the correct amount of flash without requiring your help.

TTL flash is incredibly popular with all levels of amateur photographer as well as many

enthusiasts and professionals, as it's so easy to use and has a small failure rate. However, while there is no doubt it performs brilliantly, when using TTL flash, you're leaving the camera and flashgun to determine the flash output, so you're never quite sure what you'll get. In certain situations, such as when the subject is set against a highly reflective surface, you may get an incorrect exposure. Therefore, we'd recommend you take full control and learn how to take pictures with both camera and flash set to manual. Doing so, you're guaranteed to know exactly how much flash is being produced every time as it will always give the same amount of output unless the power setting is changed. We explain how to take full control in the section 'Setting Your Flash to Manual' (far right).

Flash facts

USING OFF-CAMERA

Taking your flash off-camera is easier and more affordable than you might think, and allows for more creative results than on-camera flash.

When you have the flashgun sat on the camera's hotshoe and press the shutter, an electrical signal is sent through the hotshoe, which fires the flash. When using flashguns off-camera, there's no physical link between flash and camera, so you need something to connect the two. In the past, a cable was used, but nowadays a wireless trigger system is a far more popular choice. This works by fitting one wireless trigger to the camera's hotshoe, to act as a transmitter, while receivers are attached to each flashgun. When the shutter is pressed, a radio or infrared signal is sent from the transmitter to each receiver, firing each flashgun.

When using two or more flashguns, it's worth checking to see if they have a Slave mode. If so, you don't need a receiver for every flash. The receiver need only be on one flashgun, known as the 'Master' – when triggered, the flash is detected by the 'Slave' flashes and these automatically fire, too. All well and good, but the Slave guns have to 'see' the Master's flash, or they won't fire. In this situation, moving the flashguns so they have line of sight of the Master unit, or using wireless triggers is the solution.

One final note: it's possible to buy trigger sets that retain TTL (Through The Lens) flash control, but be prepared to have to pay extra for them – this facility doesn't come cheap! We'd suggest shooting in manual and giving our recommended flash outfit a try (see page 117 for details).

Main flash modes

The way your DSLR and flash work together is governed by the flash mode. Here are the most common flash modes that you'll find on dedicated flashguns.

AUTO **Auto:** In certain exposure modes, your DSLR will activate the built-in flash. It calculates aperture via TTL metering, but sets a high shutter speed to avoid camera shake. Convenient, but not very creative.

SLOW-SYNC **Slow-sync:** Uses a slower shutter speed to record ambient light. Good for night-time portraits where the mood needs to be recorded too, but watch for camera shake.

REAR **Rear/second-curtain sync:** The flash is fired at the end of the exposure, rather than at the start. Great for leaving a trail of light behind moving subjects.

Anti red-eye: Aims to prevent or reduce so-called red-eye in flash portraits by using a series of pre-flashes to make a subject's pupil contract before the exposure is taken.

Flash-off: Stops a camera from automatically engaging the built-in flash. It's only relevant if you shoot using one of the fully auto exposure modes.

Flash exposure compensation: Your DSLR automatically calculates the amount of flash needed for an exposure. Use this to increase or decrease the amount of flash output to your liking.

Anatomy of a flashgun

- 1) Flash head:** Can be rotated or flipped to bounce light off walls and ceilings. Most zoom to match light coverage to the focal length.
- 2) AF Assist:** Projects an infrared beam to help focus in dim light.
- 3) Hotshoe:** The connection between camera and flash. Used to trigger the flash and communicate data for TTL light metering.
- 4) LCD screen:** Shows the status of the flashgun. In this case the metering mode, range, zoom setting and f/stop are all visible. Here, we can see that the unit is set to TTL exposure mode for an aperture of f/4 and a 24mm lens, giving a range of between 0.6 to 6.9m.
- 5) Buttons and control wheel:** Used to set advanced features, like flash exposure control, metering mode etc.
- 6) Fold-away reflector and diffuser:** The reflector can be used with the gun in bounce mode to direct a small amount of light towards the subject. The diffuser is used to disperse light over a wider area when shooting with ultra wide-angle lenses.
- 7) Power and mode switch:** Turns on power to the flashgun and, in this case, dictates how the unit behaves when used off-camera in wireless TTL mode.





TOP TIP!

The hotshoe's okay, but...
You'll rarely find a serious photographer using their flashgun mounted on the hotshoe. Images taken with off-camera flash are almost always better so invest in a set of triggers and you'll notice an instant improvement.

Pro insight

**PAUL WARD ON...
FLASHGUNS**

"Flashguns offer a great degree of sophistication and power, so are a viable alternative light source to studioflash. The biggest advantage using Speedlites rather than studioflash is their portability. I much prefer being able to head out on location with a couple of flashguns than two cumbersome studioflash heads. It's particularly ideal when I'm travelling light on overseas shoots. I can put the stands within the hold luggage and keep the flashguns in my carry-on. While there are fantastic portable flash kits available, such as Elinchrom's Ranger series, the option of using two flashguns is a far cheaper one. The biggest downside is that, while powerful, Speedlites can't match the output from a studioflash head, especially with a diffuser attached."

**BRETT HARKNESS ON...
USING MANUAL FLASH**

"With manual flash, I'd suggest you spend some time practising and getting to learn how much power your flash produces in different lighting conditions. For instance, I've used Canon Speedlite 580EX II flashguns for years and know instinctively that when the subject is around 5ft away, I'll set my camera to f/8, the flash to 1/4 power and get perfect results. Having this experience is a life-saver if you need to work fast, such as at weddings. I'm often asked why I don't use the flash in TTL mode but the simple truth is that while it's a pretty reliable system it's not foolproof and can get it wrong, which is something I cannot risk. Using manual, I know exactly the output of the flash and so I prefer to trust in my experience than the TTL flash's assessment of the scene."

● SETTING YOUR FLASH TO MANUAL

Less experienced photographers may deem switching from auto to manual a step too far, but it's not as difficult as it seems and you'll soon get the hang of it. With the camera in manual, set an ISO, choose the aperture to give the depth-of-field you want, then set a shutter speed at or below the flash sync speed. If need be, change the ISO or shutter speed to ensure the ambient light exposure is correct. Then set up and switch on the flash, choose a power setting and take a test shot. You can adjust the power settings to increase or decrease the amount of flash on your subject until you've got it right. Two of our leading pro contributors regularly use manual flash – here's what they have to say about it:

Paul Ward: "I always set my DSLR to manual as then I'm in control of the exposure. In the past I used aperture-priority but my DSLR kept setting the shutter speed to 1/200sec when I used flash, when I'd prefer a longer exposure. I've stuck to manual ever since. I've used TTL flash in the past but found it's fooled by very dark or light backdrops. While I can use the flash exposure compensation facility to compensate, I've found it quicker and easier to produce consistent results using everything in manual."

Brett Harkness: "Using your camera and flash on manual seems to frighten a lot of people, but on my courses I teach attendees my 'triangle of loveliness' and they soon discover it's easier than they think. Draw a triangle with ISO at its centre – ISO is at the control of everything. Place apertures in one corner, shutter speeds in another and flash-to-subject distance in the other. Change the aperture to vary the amount of flash that reaches the subject as well as control depth-of-field, and the shutter speed to control the ambient light. Take a test shot and adjust the triangle's 'corner' settings to suit. If you need to, raise or lower the ISO. The key thing with flash photography is that it's essential you get the ambient light exposure right first – if you can do this, getting the correct amount of flash is relatively straightforward."

Which flashgun is best?

There is a huge variety of flashguns available, from basic models to highly sophisticated units, so choosing the best model to suit your needs isn't straightforward. The general rule is that the more you spend on a flashgun, the better specified it is, so it's no surprise that photographers will try to buy the best that they can afford. Flashguns are packed with functions that can be used for all manner of creative flash photography. However, as you'll also discover, while TTL (Through The Lens) flash metering is accurate and reliable, many experienced photographers choose not to use it and instead set their flashguns (and camera) to manual. By using manual, taking test shots and reviewing images on the LCD monitor, it's possible to quickly set up the flash to give perfect lighting. (That said, for

weddings and portraits where you've no time to experiment, TTL is often best.) Using flash in manual isn't as difficult as you might think, so we strongly urge you give it a try when shooting portraits.

You'll also have one major added bonus if you shoot in manual – you'll save money on kit, as you can use pretty much any flashgun – there is no need to be brand specific. You can buy budget brands like Yongnuo, or even rival brands of flashgun. So if you use a Canon EOS, a Nikon, Pentax or Olympus flashgun is okay! You need to ensure that it has manual power settings – most flashguns offer a selection of manual settings, usually in full stop increments from full power (1/1) down to 1/128th power. If you're unsure check the instructions or the manufacturer's website.



Essential flash kit

Your flashgun is a sophisticated and versatile lighting tool but it's the modifiers that determine the lighting effect. Here we cover the main accessories you need to get the very best results

YOU'D NEVER SET up a studio flash system and light your subjects using the bare bulbs, would you? Of course not! Well that principle should apply to using flashguns whenever you're shooting portraits. Use direct flash and the results are harsh and less than flattering. Some flashguns have a built-in diffuser panel that can be pulled out and placed over the head and these soften the light somewhat, but for the best results, you should bounce the flash or use a modifier. Still unsure of what you need? No problem. We've taken a set of shots with the flash above the camera and then at a 45° angle to show you the effects of using flash with the most popular modifiers at the two most common lighting positions.

THE EFFECTS OF FLASH MODIFIERS

The following images illustrate the effects of the different types of attachments available for your flashgun. As you'll note, several give very similar results, so there's no need to buy them all!

1) Flashgun only

- Undiffused, direct flash: Very harsh and unflattering light. Not recommended!
- Undiffused flash, 45° angle: Very harsh lighting with strong shadows. Avoid!

2) Flashgun bounce card

- Direct: Less harsh than direct flash but still a little unflattering. Usable but not ideal.
- 45° angle: Far better than direct flash.

3) Large softbox

- Direct: Diffused and clean light.
- 45° angle: Softer light but deep shadows.
- 45° angle with reflector: The reflector adds a little light into the shadow areas.

4) Small softbox

- Direct: Soft light but still slightly harsh.
- 45° angle: Gives a nice diffused effect but deeper shadows than a bigger softbox.
- 45° angle with reflector: The white reflector fills in the shadows a little.

5) Brolly

- Direct: Placing behind and above camera creates a shadow beneath chin.
- 45° angle: Produces a flattering light with strong shadows. A nice effect.
- 45° angle with reflector: A very pleasing effect, soft light with slight shadows.

6) Globe

- Direct: A clean, even light but some shadow beneath the chin.
- 45° angle: Clean, diffused light but harsh shadows. Similar results to a softbox.
- 45° angle with reflector: A nice clean light with slight shadows.

7) Orbis ringflash adaptor

- Above camera: Strong but even light, some shadows beneath chin.
- Around lens: Very even light, dark background due to light fall-off.
- 45° angle: Nice, diffused effect with deep shadows. A little similar to a softbox.

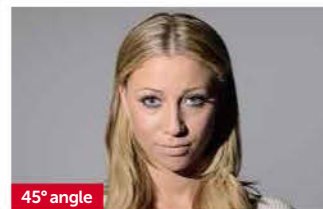
Flash modifiers



1) Direct flash



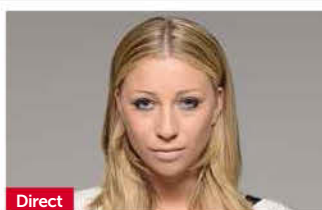
Direct



45° angle



2) Flash with bounce card



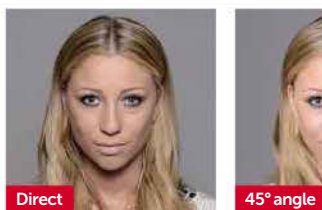
Direct



45° angle



3) Large softbox



Direct

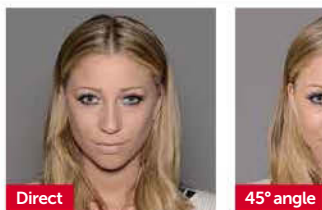


45° angle

45° + reflector



4) Small softbox



Direct

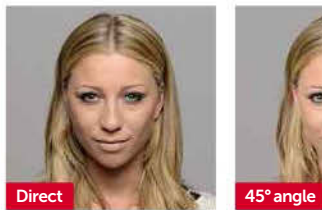


45° angle

45° + reflector



5) Brolly



Direct



45° angle

45° + reflector



6) Globe



Direct



45° angle

45° + reflector



7) Orbis ringflash



Above camera



Around lens

45° angle

TOP TIP

One advantage with using flashguns is that virtually all run off AA batteries, so you should have little problem getting hold of spares should you need them.

Build your own multiple flash outfit for under £200

● OUR BASIC WIRELESS FLASH SYSTEM

In the past, investing in a decent flash system involved spending an excessive amount of money. That is no longer the case. Now, £200 is enough to get you a multi-flash system that's more than capable of carrying out the techniques covered in this guide. In fact, since we discovered the Yongnuo's range of budget flashguns and triggers, we've used them regularly on our magazine shoots. With the addition of a few extra budget options, we've a fully kitted multiple flash set-up at a fraction of the price of buying marque brands. If you want to try out our off-camera flash techniques, think about adding some or all of our budget outfit to your current kit.



1) 2x Yongnuo Speedlite YN-560 II flashguns £40 each

Don't let the price put you off – these flashguns are built to a very high standard and offer a very good range of features, including a zoom head, Master/Slave facility and second-curtain sync. Its one omission is TTL flash, but if you're happy using manual power settings, as described in this guide, then this shouldn't prove a major problem.

2) 2x softbox kits £26 each

These unbranded collapsible softboxes from eBay are 60x60cm and come supplied with a hotshoe mounting ball & socket bracket (6) for the flashgun.

3) 2x lighting stands £22 a pair

Also bought from eBay, these two stands can be raised as high as two metres. Their maximum load of 2.5kg means they're suitable for our flash set-up.

4) 3x Yongnuo RF-603 wireless triggers £32 for a set of three

These wireless triggers, bought from eBay, are both transceivers, meaning both have transmitters and receivers built-in, so you can slip any of them on the camera's hotshoe and the others beneath the flashguns. While not TTL-compatible, they're low-cost options for manual flash and double up as a remote shutter release too.

5) Cold hotshoe adaptors £9 a pair

These metal plates, ordered from eBay, allow you to mount the flashguns on to lighting stands via a standard tripod bush.

TOTAL COST OF OUTFIT:

£195

Flash accessories

FLASH TRIGGER



When your flash isn't mounted on the camera's hotshoe, you need a way to get it to fire. Leads were

once commonly used and while still available, we'd suggest you invest in a set of wireless triggers. There are various inexpensive options as well as pricier models that allow full dedication, including TTL flash. While Pocket Wizard is the pros' choice, also check out models from Yongnuo, Interfit, Hahnel and Hama.

LIGHT STANDS



Unless you have a couple of helpers with you, you'll need some way of holding the flashguns in

position. Lighting stands are relatively inexpensive and versatile, and are a lightweight option too, although you could simply take along a couple of tripods instead. Ideally, look for stands with a screw thread at the top.

SLAVE CELL



If your flash lacks a Slave mode, you can either fit a trigger or instead buy a slave cell unit that slips onto the

hotshoe. Just be sure its sensor is in line of sight of the 'Master' flashgun's output otherwise it won't trigger the flash it's attached to.

FIXINGS



Many flashguns are supplied with a plastic shoe on which sits the flashgun, which can be rested on a

flat surface or mounted on a tripod or lighting stand. If you don't have one, they're readily available online or you can use a cold shoe adaptor instead.

COLOUR GELS



Place colour gels in front of the flash head and you can add colour and visual interest to backdrops or even

add colour to your subject's hair and face. Brands such as Rogue and Hohl produce excellent colour gel sets and holders that fit most flashguns, or you can try making your own from colour acetate and using sticky tape or Blu-Tack to hold it in place.

Pro insight

PAUL WARD ON FLASH MODIFIERS

"I generally only use the main types of modifiers with my flashguns – while there's a vast range of options now available, I find most give a similar type of effect. On general location shoots, I'll use either a small softbox or a brolly, while indoors when working in a relatively confined area, such as when shooting in nightclubs, I'll use a small Rogue FlashBender to bounce the light. I've also invested in a couple of adaptors that allow my larger Bowens softboxes to be used with my flashguns. One thing to always bear in mind when using a modifier is that they do absorb a fair amount of light, so you need to ensure you're using a high-powered flashgun to compensate – you can also raise the ISO rating to ISO 400 or 800 to boost the flash range."



Introductory flash techniques

There are numerous ways to light a subject with flash. Here are a few easy but effective methods

ONCE YOU DISCOVER the options that come with removing the flashgun from the camera, the possibilities for your flashlit portraits are quite literally endless. Using off-camera flash set-ups with one, two or more flashguns and the numerous available modifiers allows you to light not only the subject but also the background in any number of ways, from high-key to spotlight 'Hollywood-style'. Here we offer a few simple flash techniques that give very high-quality results. With all these techniques – with the exception of high-speed flash – set both your camera and flashgun to manual.

White wall as a diffuser

If your home or office has white walls, then you've the perfect surface to act as a large flash diffuser. While the common practice is to point the flashgun towards the subject, with this technique, you aim the flash head at the wall instead and allow the light to bounce off its surface and spread to cover a far wider area with a beautifully diffused light. You can use a single flashgun with this set-up, although being able to use a second flash, too, will double the output, increasing the range covered and your choice of exposure settings.

With this technique, after placing your subject in position, you set up the flash to the side of you on a stand and aim it towards the white wall that your subject is facing. If you have two flashguns, you'd place the second on the other side of you. The flash heads are aimed at the wall, although if you have a low white ceiling, you can also tilt it upwards at an angle. This will give a similar effect to using a huge softbox to spread the light. It gives a very flattering effect and is a particularly useful technique to use if your subject has bad skin.

You'll need to place yourself in front of the subject but keep a bit of distance so you're not obstructing the light bouncing from the wall from reaching the subject.

Because the light spreads so wide, you'll need to take care with your exposures, especially if shooting handheld. Thankfully the lighting effect suits shallow depth-of-field so using a very wide aperture improves the aesthetic nature of the image as well as helping to minimise the risk of camera shake. If there remains a risk of shake, raise the ISO rating to 400 or 800 and/or use a tripod or monopod to support the camera.

One thing to remember is that the colour of the flash is determined by the colour of the surfaces it bounces off, so avoid coloured surfaces unless you want your subject to take on a magnolia tone!



1) Above: Set up one flashgun on a stand to one side of you and aim it at the wall that the subject is facing (ie pointing behind you).

2) Below: The result of the flash bouncing off the white wall is a very attractive, diffused light that gives a very flattering effect.



3) Left: You can add a further dimension to images by placing a flash behind your subject aimed towards the rear of the head.

4) Above: Using a second flashgun for the hair adds a professional touch to your portrait. Adjust its position and power to vary the result.



Highly directional light

You can use your flashgun to create highly stylised portraits with an air of mystery. By having your subject lean against the backdrop, aiming the flash at a narrow angle and then shooting from the opposite side, you can capture images with the subject as a near-silhouette with a strong rim light around them. This is a popular technique for boudoir and erotic photography but can be applied to other forms of portraits too.

Because the lighting is so strong and directional, you need to be aware that the position of the flash and how your subject poses is critical to the effect. Some photographers prefer to get the position and angle of the flash right first, then adjust the model's pose, others prefer doing it the opposite way. Use whichever process suits you, then try making slight variations to both the flash and the subject to see how the effect changes. Moving the flash further away from the subject gives a sharper light, while moving it closer makes it more diffused. As the subject is generally in shadow, have them extend their legs and minimise the amount of contact with the wall to reveal their shape and create more attractive spreads of shadow.



1) This shot of the model against a purple wall is okay, but with strong colour backdrops, there's the chance to be a bit different with flash.



2) Set up the flash. Place the flashgun fairly close to the wall and angled so that the head points towards the wall rather than the subject.



3) Fire a test shot. Check (and adjust if necessary) the flash power and direction, as well as how the light falls on your subject and their pose.

4) Top: The final result oozes mood and mystery. Often, the best results are when the subject looks at the flash, giving a nice rim light around the face.

Standard 45° lighting

The most common form of lighting arrangement with a single light source is to place it slightly higher and angled at 45° to the subject. In many respects this gives a natural fall of light on to the subject, which is why it's so pleasing to the viewer's eye. When using this set-up, fire off a small selection of test shots, changing the angle of the flash slightly but also having your subject turn their face slowly from facing the camera to facing the flash so you're able to see how the face suits the light. Some faces look best at an angle, while others look better with the light more straight on.

One other consideration to make is the deliberate inclusion of shadows by how close your subject is to the background. Have them lean against the wall and you'll include their shadow on the backdrop, while having them stand a couple of feet away from it reduces or removes the chance of any shadow being recorded.

The type of modifier you use will affect how your subject and the shadows are rendered. Shoot without one and you'll have strong directional light and very defined shadows on the opposite side of the face (and possibly the wall too). Use a brolly or softbox for a far more flattering and even result, with softer shadows.

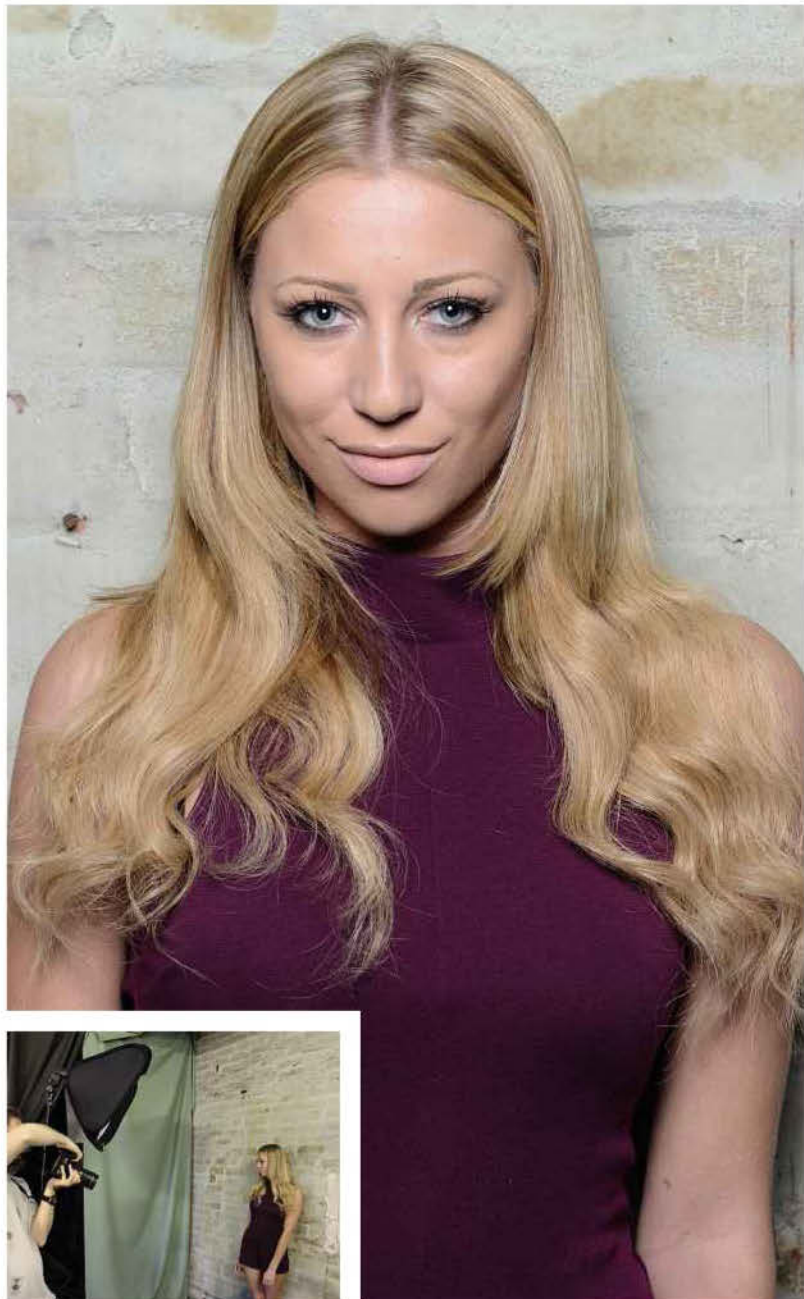


1) This set of images illustrates how easy it is to light a subject using one flashgun, fitted with a softbox. For the main shot, the flash is placed at eye-level and close to the wall.

2) The result of having the flash at such a tight angle is a strong shadow on the opposite side of the subject (above left). It's ideal for more dramatic effects but not overly flattering.

3) Moving the flash so that it is 45° to the subjects gives a far better result (above right). There is still some shadow on one side of the subject but the effect is more appealing.

4) For a far more even light, place the flashgun above and behind your shooting position. This provides an even spread of light over your subject for a more flattering result (right).



Essential technique

FASHION RINGLIGHT EFFECT

The ringflash has been a favourite with fashion photographers for many years. With the lens slipped through the aperture at its centre, the ringflash can provide a strong but even light that is incredibly flattering, giving bright, ring-shaped catchlights in the subject's eyes. Unfortunately it's a very expensive bit of kit, too, so for many, hiring one was the only option. In recent years ringflash adaptors have become available, which have an opening that snugly fits over the flash head. The flash burst then travels around the ring via a series of mirrors and out through a diffused panel on the front side. Depending which one you buy, you can leave the camera mounted on the hotshoe or use it off-camera. This image was taken using the Orbis, held in place around the lens and triggered via a wireless trigger. As you can see, the effect is close to that of a ringflash, but at a fraction of the price. The effect from ringflash adaptors works particularly well on female models but is very useful at reducing the prominence of wrinkles when photographing older subjects.



While they can't truly match the effect of a professional ringflash, adaptors like the Orbis mimic the effect closely.


FLASH KIT USED

1x Canon Speedlite 580EX flashgun
2x Yongnuo triggers
1x lighting stand
1x softbox

How to mix flash and flare from the sun

IT'S UNUSUAL TO want to add imperfection into images, but that is what this technique is all about. Flare is the result of a bright hotspot (usually the sun) in (or just outside) the image frame, which causes reflections within the lens optics, resulting in unsightly shapes or streaks, as well as a loss in contrast. The use of multicoatings on lens elements minimises this problem but it still occasionally occurs, especially if the optics aren't clean. While usually a distraction, flare can add a creative effect, as shown here.

● PAUL WARD

"The first thing you need to do is determine the position of the model. The multicoatings on the optics of current lenses are highly efficient at reducing or eliminating flare from the sun, so you'll need to try out your current lenses and see which delivers the worst (or should that be best?) flare. Alternatively, follow my lead and buy a very cheap, old lens from eBay – I used a manual focus Vivitar 28mm f/2.5 wide-angle bought for £15. It's an M42 screw thread, so I also needed an M42 to EOS adaptor to allow it to fit my camera. There are no electronics, so I've no AF and I need to turn the aperture ring to change f/stops while shooting in Manual mode. Because you're shooting into the sun, manual focus can be difficult and I regularly use the LiveView facility and magnify the image so I can focus critically."



1) Position the subject so that they have the sun behind them. Take a couple of test shots to determine the exposure for the ambient light. It's important to keep the shutter speed below the flash sync speed. Set a low ISO and close down the aperture until you have a suitably slow shutter speed. I used 1/200sec at f/11 (ISO 160).



2) I position the flash behind me and raise it so it's firing over my shoulder, angled at around 35° to the model. You do need to take care of your lighting when shooting in the wind. Don't risk your lighting stand blowing over – have a friend or assistant hold it. On this particular shoot, make-up artist Karen Hegarty is on hand to ensure our flash with softbox isn't blown over.



3) I adjust the manual flash power output until it gives a suitable exposure. As it's bright, I need 1/2 power to expose Gemma correctly.

Flash gels

YOUR FLASHGUN IS daylight-balanced, meaning that its output is the same colour temperature as daylight (around 5500K). This means that images captured with flash exhibit natural colour reproduction free of colour casts. It may seem odd, therefore, to want to slip a coloured piece of plastic in front of the flash head to purposely colour the light. However, that's exactly what flash gels are designed to do, allowing you to use flash to either add colour to drab backdrops, add mood to a scene or to fire coloured light onto your subject.

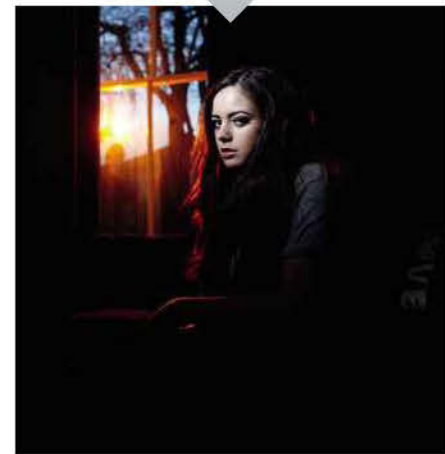
● BRETT HARKNESS

"Even though I rarely use flash gels in my photography today, there was a time when I often fitted off-camera Speedlites with flash gels to add a splash of colour to brickwork. While many people think it's best to use them on white walls, I find they work better on coloured walls, the darker the better. If it's textured, even better, as this helps add additional visual interest to the overall scene.

"There are two distinct ways in which flash gels can be used. The first and the most common is to keep the flashguns out of shot and illuminate the scene (and possibly the subject) with the colour gels. A less popular method, but one that can be very effective, is to include the flashguns within the image frame so that as well as bathing parts of the scene in colour, the flashing heads appear as coloured spotlights within the image. Whichever method you decide to use, remember that it's essential that your subject is lit by a flash with no gel to allow the subject to appear natural. For both the flash gel techniques covered here, I used gels from the Rogue Universal set.

"While adding colour via gels is normally reserved for boring locations that need additional visual interest, it can also be used

Adding colour to the scene



to add mood to a scene. While reds and greens are good choices when you want to produce a strong and dramatic effect, I prefer to use blues and oranges when I want the result to be more subtle.

"For this particular image, I wanted to mimic warm evening light coming through a window, so tried out a CTO and Rust gel, opting for the latter. I also wanted to add a little visual interest to the scene, so decided on adding another flash to the set-up with a blue gel attached."

1) Set up the main flash on a softbox close to the subject to expose the face correctly. The exposure was 1/125 at f/5 (ISO 125) with the flash at 1/16 power.

2) After deciding on a suitable viewpoint to shoot from, I had one person stand outside, aiming a flashgun fitted with a Rust gel high and into the room and set to 1/4 power. The result was a warm orange light being cast into the room.

3) A flashgun fitted with a blue gel was tucked into the back of a sofa and set at 1/4 power, projecting a cool light into the scene. The result is subtle but effective at adding mood to the scene.

Use gels and include hotspots

While the previous technique involves hiding the flashguns, this one includes them in the image. By having the flashguns included in the frame and aimed at the camera, you can include the actual bursts of the flash for effect. For this technique to work, you need to ensure that the power of the gelled flashguns are balanced so that the hotspots aren't overpowering and the colours from the gels are visible in the scene. Keep this in mind and set-up will be straightforward.

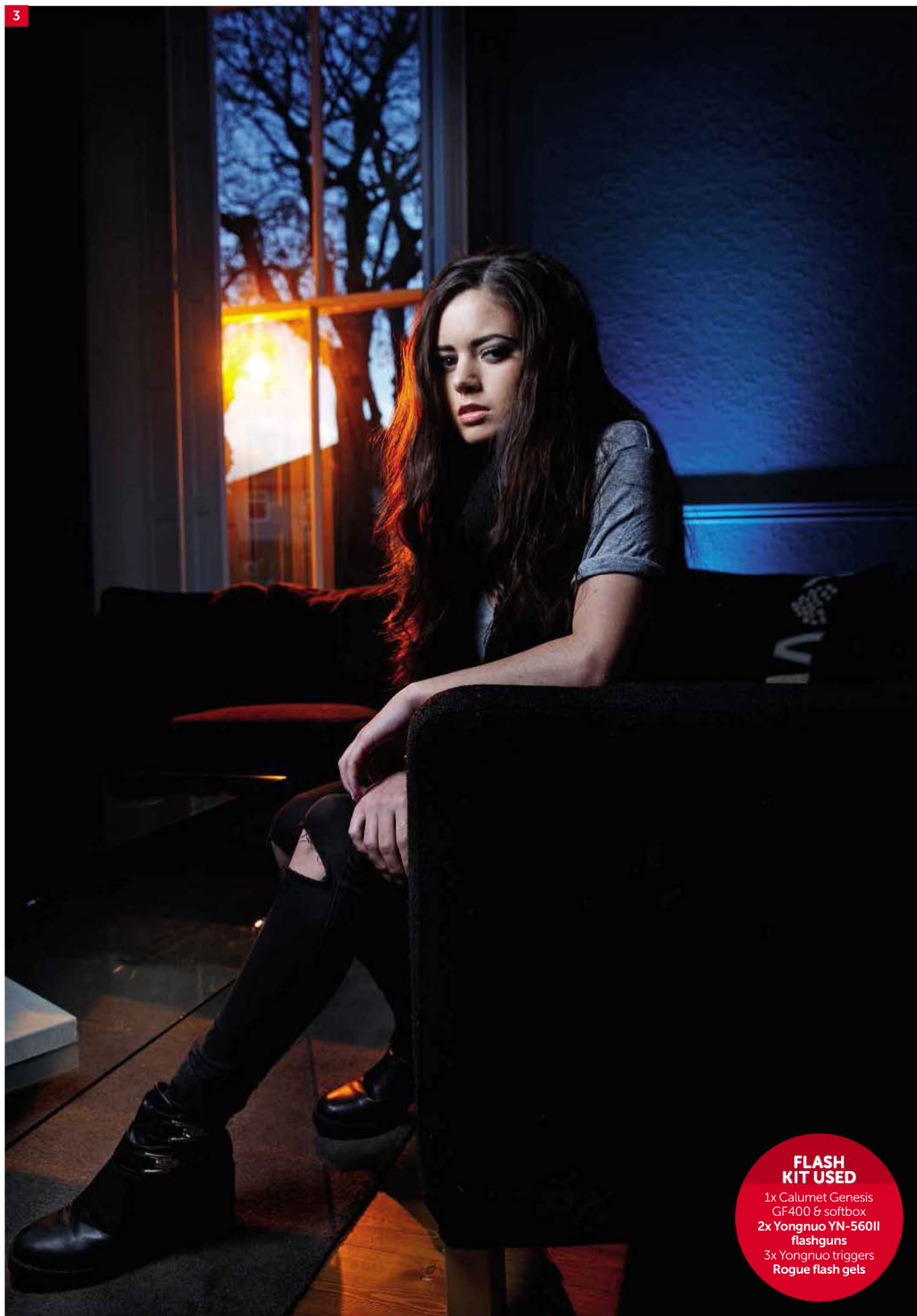
1) Find a location and pose your subject. Introduce the main flashgun and set up the manual power setting to give a decent exposure. We used 1/200sec at f/5 (ISO 125).

2) Frame to allow room for the hotspots to fit in. Placing the subject in the centre and shooting in landscape format is a good option. Introduce your first colour.

3) Once happy with the first, introduce a second colour – you can use stands or have someone hold the flashguns. Try to keep arms and hands out of the shot if possible.

4) Gelled flash adds colour and interest for unusual but attractive results. If hands can't be fully excluded (as here) you can easily remove them in Photoshop.



**FLASH
KIT USED**

1x Calumet Genesis
GF400 & softbox
2x Yongnuo YN-560II
flashguns
3x Yongnuo triggers
Rogue flash gels



TAKE BETTER PICTURES

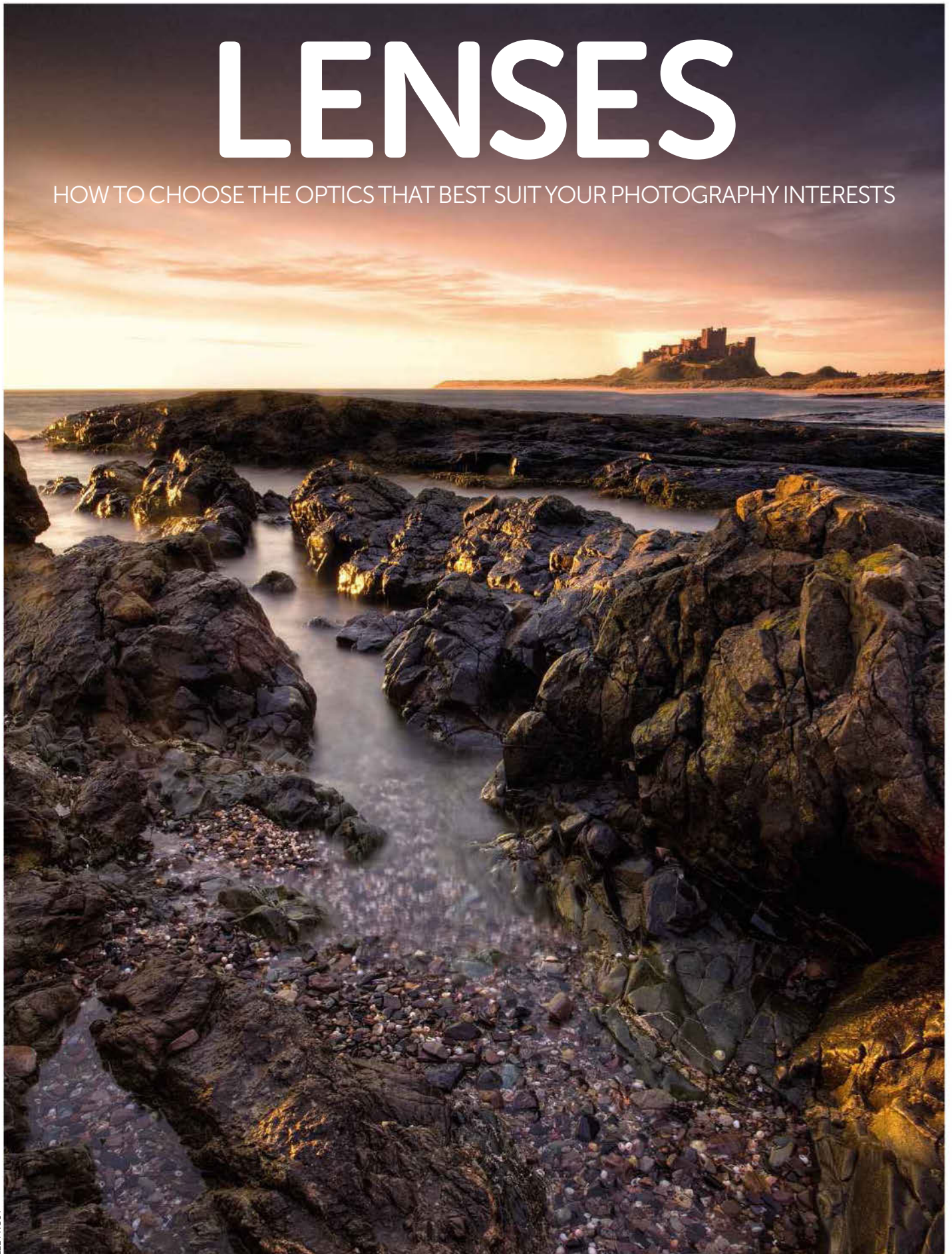
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LENSES

HOW TO CHOOSE THE OPTICS THAT BEST SUIT YOUR PHOTOGRAPHY INTERESTS



Fundamentals of lenses

Follow our essential advice to choosing the right lens for your needs

THE KEY WITH CHOOSING LENSES is to put together a system that serves all your needs. What those needs are will depend on the subjects you tend to shoot – specialist subjects such as sport, nature and close-ups have more specific optical requirements. However, most of us like to try a bit of everything, so a more general selection will be required. In terms of focal lengths, if you have lenses covering 15mm to 300mm on a full-frame DSLR (12mm to 200mm for APS-C sensors), you'll be equipped for just about any situation. The wider focal lengths are ideal for scenic photography – landscapes, architecture, street scenes, travel – the mid-range focal lengths are great for portraiture, details and general use, while telephotos suit sport, candid and nature. Saying that, you can take brilliant landscapes with a telephoto and amazing nature shots with an ultra-wide, so use your imagination and make the most of all your lenses.

In this digital age, lens quality is more important than ever. High-resolution sensors are so good that they can easily out-resolve inferior lenses, so any flaws in optical design

will be highlighted. These problems are at their worst in ultra wide-angle zooms, where chromatic aberration, diffraction, vignetting, distortion and loss of sharpness at the image corners are all common problems – and the less you pay for the lens, the more it's likely to suffer; though not in all cases. Telezooms tend to suffer less from all of the above because their optical design isn't as extreme, but they don't escape completely and the more pixels your camera has, the more your images will highlight any problems.

Optical flaws can be corrected to an extent during post-production, but it's preferable if they don't exist in the first place, or are at least minimised. The best way to ensure that is to buy the best lenses you can afford. Don't necessarily take the price of a lens as the only indicator of quality, as certain lenses from certain manufacturers have reputations, both good and bad. Instead, read reviews and ask the opinions of other photographers. Whether you buy prime (fixed focal length) or zoom lenses is down to you and your budget.

Primes tend to have the edge in terms of image

Prime v zoom

A prime lens has a fixed focal length while a zoom's is variable. Both have advantages and disadvantages. In general, primes offer higher image quality, faster maximum apertures and are more compact and lightweight, but buying several proves costly. A zoom is more versatile and saves money as it covers a range of focal lengths. Quality isn't as high (but comes close) and the maximum aperture is slower, but its convenience makes it more popular.

quality, but zooms are more versatile and you'd be hard-pressed to tell the difference between a shot taken using a £500 zoom and another shot with a £1,000 prime lens. Lenses from independent manufacturers such as Sigma and Tamron should be considered alongside the likes of Canon and Nikon – optically they're often as good but at more attractive prices. Whichever lenses you buy, to get the best optical performance from them, always use a mid-range aperture of f/8 or f/11 whenever you can. Image quality is at its lowest at the widest and smallest apertures, especially with wide-angle zooms, and at its sharpest at mid-apertures.

Main types of lenses for digital photography



1) Wide-angle

With a wider field-of-view than the human eye can see, wide-angle lenses allow you to include more of the scene in the image frame, making it the ideal choice when shooting sceneries or taking pictures indoors or when space is tight. There's an extensive choice of primes and zooms available, so you're not short of options. Wide-angles allow you to exaggerate perspective, accentuating depth, which can lead to creative results. But you do need to be aware of its tendency to distort, especially subjects that are towards the edges of the frame. While this can be used to your advantage, it can also ruin your images. See page 144 for details on wide-angles.



HELEN DIXON



2) Telephoto

A telephoto zoom is often the first lens a DSLR or CSC photographer will add to their outfit. The extra pulling power a telephoto gives is ideal for filling the frame with relatively small or distant subjects. It's also ideal when you're trying to take pictures of a subject without it being aware, such as wildlife or when shooting candid. As it's a lens that compresses perspective, it's perfect for producing flattering portraits. The 50-200mm and 70-300mm telezooms are popular but need to be used with care to avoid the problem of camera shake. If you can afford to, invest in a telephoto with a maximum aperture of f/2.8. See page 146 for more details on telephotos.



HELEN DIXON



3) Macro

Physically, macro lenses look just like a regular lens, but the major difference is they can focus much closer, allowing you to fill the frame with tiny subjects such as insects and butterflies. They're also specially designed for use at close focusing distances, so optical quality is superb. The focal length tends to be either 50/55mm or 90/105mm. Both are useful and the vast majority offer 1:1 (life-size) reproduction, but the longer focal lengths are more suited to photographing nature because they have a longer working distance, which means that you don't have to get particularly close and risk frightening your subjects away.



HELEN DIXON



4) Standard

Once upon a time, SLRs were sold with a 50mm 'standard' lens so every keen photographer had one. Today you get a standard zoom instead like the 18-55mm or 18-105mm. However, it's worth investing in a 50mm prime because for little outlay you get a compact and lightweight lens that's pin-sharp, focuses down to just a few inches, has a super-fast maximum aperture of at least f/1.8, if not f/1.4 or f/1.2, and is perfect for handheld, low-light photography. Use with an APS-C sensor and you have a brilliant 75-80mm portrait lens which, used at its widest aperture, will give minimal depth-of-field and produce superb images.



BJORN THOMASSEN



5) Tilt and shift

These expensive lenses serve two purposes. First, they prevent converging verticals when shooting architecture. Instead of leaning back to include the top of a building, you can shift the front of the lens up but keep the camera back parallel to the subject building. Second, the 'tilt' facility lets you angle the front section of the lens down so the plane of focus is parallel with the plane of the camera's sensor, thus increasing depth-of-field without having to set a smaller aperture. By tilting the other way depth-of-field is reduced to almost nothing, producing unusual effects – similar effects can also be achieved using a Lensbaby for a fraction of the cost.



BENEDICT CAMPBELL

Understanding effective focal length

Most lenses available for use on your digital camera were designed for 35mm film SLRs or full-frame digital SLRs that have a sensor the same size as a 35mm film frame (24x36mm). However, only a handful of digital SLRs at present actually have a full-frame sensor, while the vast majority use an APS-C sized sensor that's smaller than full-frame 35mm. This means that the focal length of 'normal' lenses is increased, to what is usually termed the effective focal length. The amount of increase can be calculated using a magnification factor (MF) and this is governed by the size of the sensor in the camera. Most

cameras have an MF of 1.5x, although for Canon it is 1.6x and for Four-Thirds cameras 2x.

For landscape and other subjects where wide-angle lenses are mainly used, this focal length increase is a disadvantage. For example, an ultra-wide 17-40mm zoom will effectively work like a 25-60mm standard zoom on a digital camera with a MF of 1.5x. To get the same effect as a 17-40mm zoom you would therefore need something like a 10-20mm or 12-24mm zoom. For sport, nature and other subjects requiring telephoto lenses, the focal length increase is more beneficial because it makes modest lenses more powerful.

A 70-300mm zoom effectively becomes a 105-450mm zoom on a camera with a MF of 1.5x, for example, so you can fill the frame with more distant or smaller subjects.

Another factor to consider is that lenses are at their sharpest in the centre and at their softest towards the edges. Cameras with an APS-C sensor therefore get the best from full-frame lenses as they use the sharper central area of the lens's image circle and exclude the outer limits of the image circle where image quality is lower. Understanding focal length can be confusing, but our tables below should help you understand it better.

Camera brand/models	Multiplication factor	Focal length on lens	Sensor size				
			Full-frame	APS-H	APS-C	APS-C (Canon)	Four-Thirds & Micro Four-Thirds
Canon			1x	1.3x	1.5x	1.6x	2x
All EOS models (except below)	1.6x	14mm	14mm	18mm	21mm	22mm	28mm
EOS-1D series	1.3x	15mm	15mm	19mm	22mm	23mm	30mm
EOS 5D, 6D & EOS-1DS/X series	1x	20mm	20mm	26mm	30mm	32mm	40mm
Fujifilm		24mm	24mm	31mm	36mm	38mm	48mm
All X-series models	1.5x	28mm	28mm	36mm	42mm	45mm	56mm
Nikon		50mm	50mm	65mm	75mm	80mm	100mm
All D-series (except below)	1.5x	85mm	85mm	110mm	127mm	136mm	170mm
D600, D700, D800 & D3/D4 series	1x	100mm	100mm	135mm	150mm	160mm	200mm
Olympus & Panasonic		10-17mm	10-17mm	13-22mm	15-25mm	16-27mm	20-34mm
All digital SLRs and CSCs	2x	10-20mm	10-20mm	13-26mm	15-30mm	16-32mm	20-40mm
Pentax		10-22mm	10-22mm	13-29mm	15-33mm	16-35mm	20-44mm
All K-series and Q-series models	1.5x	11-18mm	11-18mm	14-23mm	16-27mm	18-29mm	22-36mm
Samsung		12-24mm	12-24mm	16-31mm	18-36mm	19-38mm	24-48mm
All NX series models	1.5x	16-35mm	16-35mm	21-45mm	24-53mm	26-56mm	32-70mm
Sigma		17-35mm	17-35mm	22-45mm	25-53mm	27-56mm	34-70mm
All SD models	1.7x	17-40mm	17-40mm	22-52mm	25-60mm	27-56mm	34-80mm
Sony		18-55mm	18-55mm	23-71mm	27-82mm	29-88mm	36-110mm
All NEX & Alpha (except below)	1.5x	18-200mm	18-200mm	23-260mm	27-300mm	29-320mm	36-400mm
Alpha 7, 99, 850 and 900	1x	18-270mm	18-270mm	23-351mm	27-405mm	29-432mm	36-540mm
		24-105mm	24-105mm	31-136mm	36-157mm	38-168mm	48-210mm
		28-70mm	28-70mm	36-91mm	42-105mm	45-112mm	56-140mm
		28-300mm	28-300mm	36-390mm	42-450mm	45-480mm	56-600mm
		55-200mm	55-200mm	71-260mm	82-300mm	88-320mm	110-400mm
		70-300mm	70-300mm	91-390mm	105-450mm	112-480mm	140-600mm
		100-400mm	100-400mm	130-520mm	150-600mm	160-600mm	200-800mm

Effective focal length The table above shows the effective focal length increase on the majority of popular brands of DSLR and CSC cameras. Use this magnification factor with the table on the right to work out the effective focal length of popular prime and zoom lenses.

Sensor sizes These images were all taken with a 35mm lens from the same spot and show the effect of the magnification factor.



How different lenses record a scene

Your choice of lens determines how the scene is captured, so you need to be clear which is best to use for every shooting situation. Our comparison sets show how lenses affect field-of-view and perspective

The angle-of-view

This term, measured in degrees, refers to how much a lens actually 'sees' and is generally related to focal length. A 50mm standard lens (33mm in APS-C) is generally regarded as having the closest field-of-view to the human eye. Wide-angle lenses have a greater angle-of-view than the 50mm 'standard' and therefore include much more in a picture than you can see with your own eyes. The shorter the focal length (smaller the number), the wider the lens and the greater the angle-of-view. Normal wide-angle lenses have a focal length of 24mm or less (on a full-frame DSLR). Any wider than that – such as 20mm or 17mm – is classed as 'ultra wide'.

Telephoto lenses have a tighter angle-of-view than a standard lens and magnify the subject so it appears bigger in the frame. The longer the focal length (bigger the number), the narrower the angle-of-view and therefore the less you can include in a picture.



Perspcetivc

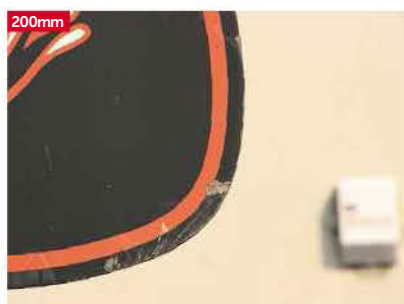
What many photographers don't realise is your choice of lens can have a drastic effect on perspective. When shooting a subject, how you relate it to the background can be radically altered by the type of lens you use. Take an image with a wide-angle lens and you increase the depth of the scene and strengthen perspective. Use a telephoto and perspective is reduced; the scene is compressed so that it has far less depth.

To show changes in perspective, we shot a series of images at focal lengths from 10mm to 400mm, ensuring that the main subject appeared at a constant size in each image. This was achieved by adjusting the camera-to-subject distance – shooting from close-up with a wide-angle lens and moving further away as the telephoto setting increased. As you can see, the difference in perspective is enormous – always bear this in mind when you're placing subjects against a backdrop.



Dcpth-of-ficld

When you focus on a subject, an area in front and behind the focused point also appears sharp and this area is termed depth-of-field. The choice of aperture has a major effect on depth-of-field, with large apertures providing a shallow depth-of-field and small apertures allowing far more of the scene to be recorded in sharp focus. However, two other factors affect depth-of-field – the camera-to-subject distance and the focal length of the lens in use. As you'll discover when you use a variety of lenses, you get far more depth-of-field with wide-angles than with telephotos. So with an 18-200mm zoom set to f/8, the depth-of-field at 18mm far exceeds that at 200mm. Therefore, as well as considering how focal length affects perspective, you should also consider how you can use it to limit or increase depth-of-field. The shots below were all taken at f/8 from the same spot. Note how depth-of-field appears to reduce as you zoom in.



Lcns problems

There are a number of problems to watch out for with lenses:

Flare

✗ **FLARE** Stray light from the sun, or any bright light source, can result in flare, which can reduce image contrast and result in hotspots in the image. It's easily avoided by using a lens hood or shading the lens with your hand or a bit of card.



✗ **DISTORTION**

This is the phenomenon where straight lines appear curved in an image. Barrel distortion makes the centre of a line bow towards the frame edge, while with pincushion distortion, the opposite happens. Barrel distortion is most prominent in wide-angle shots, while pincushion distortion can appear at telephoto settings. This particularly affects cheaper lenses and zooms with a wide range. Lenses boasting aspherical lens elements minimise problems with distortion. It can also be rectified to a lesser or greater extent using Photoshop.

✗ **CHROMATIC ABERRATION**

This technical term refers to how different wavelengths of light passing through a lens focus at various points. The result is usually a colour fringing; a thin but marked colour band that runs along the edge of contrasty image subjects. It is a lens problem that is controlled by the use of apochromatic lens elements.

Types of wide-angles

There are three main types of wide-angle lenses available, each offering its own pros and cons. Here, we explain the virtues of each...

Ultra wide-angle zooms

This group of lenses has become increasingly popular. That's no surprise as the range they cover offers incredible versatility in such a small and inexpensive lens. In fact, the ultra wide-angle zoom is arguably one of the best-value lenses you could own. There are a variety of focal lengths available, with those around 11–22mm being the most suitable for cameras with an APS-C sized sensor. In truth, all cover a very similar range, although there are one or two exceptions to note. The Pentax 10–17mm fisheye offers a 180° angle-of-view at its widest end, so, in a sense, you're getting a fisheye and ultra-wide zoom rolled into one. It's also worth noting that, unlike most ultra-wide zooms, the Sigma 12–24mm can be used on full-frame and APS-C cameras. Finally, while the 16–35mm lens is popular with film and full-frame camera users, the 24–53mm range it covers with APS-C sensors is quite limited, so we'd suggest you avoid it.



Anatomy of a wide-angle zoom

- 1) Petal hood** Ultra wide-angles come supplied with a dedicated hood to avoid vignetting and flare.
- 2) Large, eave front element** The front element normally has a prominent curve, leaving it exposed to dust and scratches, so take care to keep it covered in transit.
- 3) Manual focus ring** Normally towards the front of the lens and reasonably wide. You'll rarely need to use it, as wide-angle lenses have excellent autofocus.
- 4) Zoom ring** This is normally found towards the back of the barrel. Most are wide with a grooved surface to allow you to grip it easily.
- 5) Focus distance** Many lenses have the focus-distance scale marked on the barrel, while some of the more upmarket models have a focus-distance window.
- 6) Hyperfoveal scale** (see inset) This scale allows you to estimate how much of the scene will appear sharp at your choice of aperture.
- 7) Internal focusing** If you're planning to use filters, lenses with an internal focusing system offer the benefit that the front of the lens doesn't rotate when focusing, so you don't have to keep readjusting them.

Fixed wide-angles

Small, lightweight and compact, with high-quality optics, these are very desirable lenses that are available in various focal lengths and have been designed to offer the ultimate in wide-angles for digital photographers. They start with the ultra wide-angle 14mm, which is particularly suited to architectural photography, when trying to fill the frame with a building from a short distance. Wide-angles from 20mm to 28mm are ideal for landscape photography and are also used by travel photographers. However, their use with cameras sporting an APS-C sensor is limited, especially as a standard kit lens covers this range.



Fisheye lenses

The fisheye offers the most extreme field-of-view. There are two types – the circular and the full-frame fisheye, both producing very different results. Circular fisheye lenses, when used on a full-frame camera, provide round images with a 180° angle-of-view. They distort perspective, especially when the subject is close and, with close-focusing capabilities, are perfect for comical portraits. The full-frame fisheye (also known as a diagonal fisheye) offers a 180° field-of-view and can capture incredibly wide vistas. They're very specialist, very expensive and have limited use, so hire one from a pro dealer before you buy.



WHY USE A WIDE-ANGLE?

Ever wanted to photograph a subject or a scene and found that you can't fit it all in the frame? Then you need a wide-angle lens. With a field-of-view that extends far wider than the human eye, it's the perfect optic for capturing wide vistas or cramming large objects in the frame. Using such a lens comes at the price of characteristics like exaggerated perspective and distortion, but knowing what to expect and how to use it creatively allows you to take shots that aren't possible with any other type of lens.

Understanding focal lengths: Wide-angles

The focal length stated on a lens is usually related to cameras using 35mm film or full-frame sensors. If your camera has an APS-C-sized sensor, then you're effectively cropping the image and so giving the effect of a longer focal length lens on a full-frame sensor. The chart below shows popular wide-angles and how the effective focal length changes when used with digital cameras.

Focal length on lens	Cameras Full-frame	APS-H	APS-C	APS-C (Canon)	Four-Thirds
	1x	1.3x	1.5x	1.6x	2x
8mm	8mm	10mm	12mm	13mm	16mm
14mm	14mm	18mm	21mm	22mm	28mm
15mm	15mm	19mm	22mm	23mm	30mm
20mm	20mm	26mm	30mm	32mm	40mm
24mm	24mm	31mm	36mm	38mm	48mm
28mm	28mm	36mm	42mm	45mm	56mm
10–17mm	10–17mm	13–22mm	15–25mm	16–27mm	20–34mm
10–20mm	10–20mm	13–26mm	15–30mm	16–32mm	20–40mm
10–22mm	10–22mm	13–29mm	15–33mm	16–35mm	20–44mm
11–18mm	11–18mm	14–23mm	16–27mm	18–29mm	22–36mm
12–24mm	12–24mm	16–31mm	18–36mm	19–38mm	24–48mm
16–35mm	16–35mm	21–45mm	24–53mm	26–56mm	32–70mm
17–35mm	17–35mm	22–45mm	25–53mm	27–56mm	34–70mm
17–40mm	17–40mm	22–52mm	25–60mm	27–56mm	34–80mm

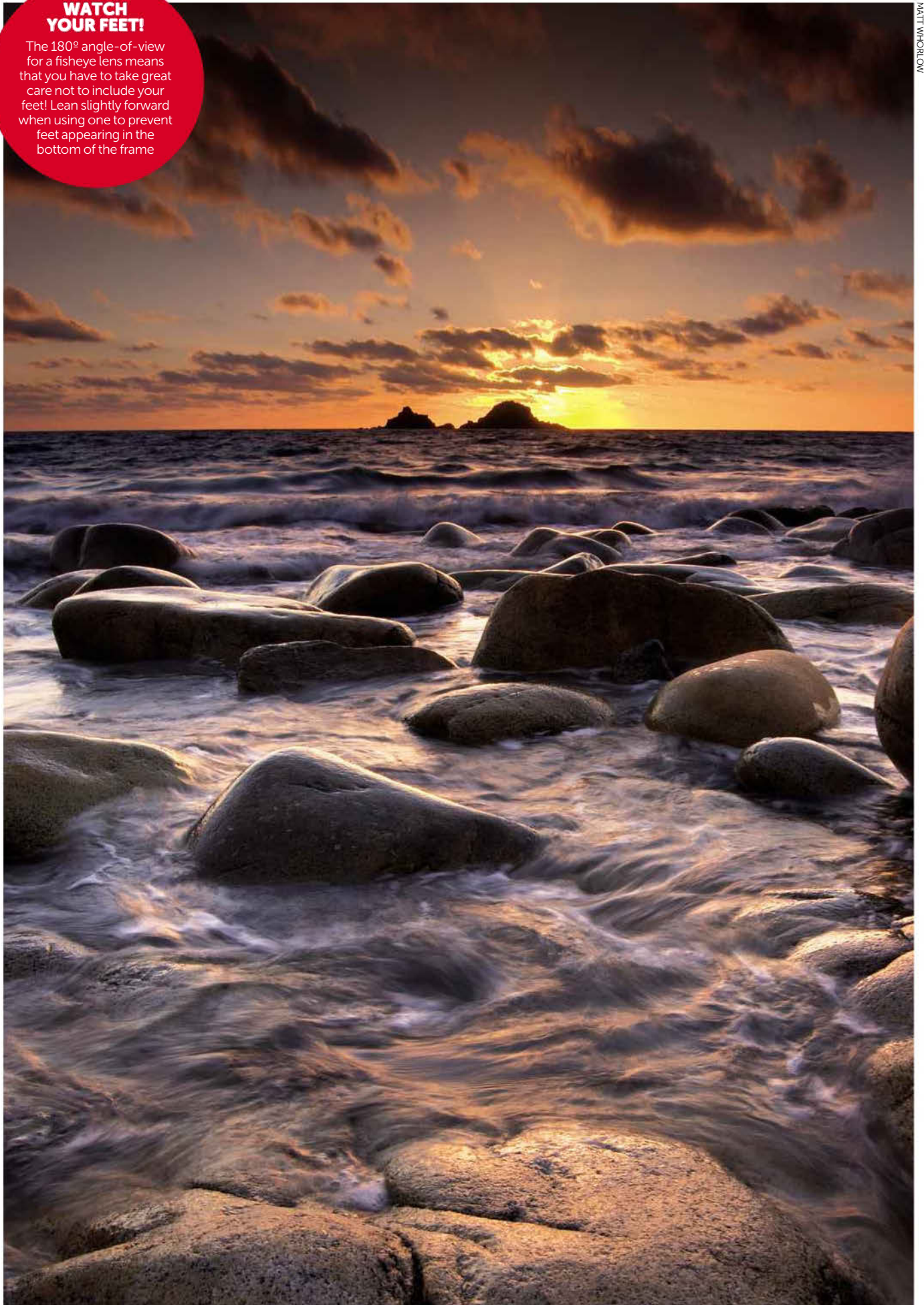


Digital-only lenses

When you're choosing a lens, check if it's for use with film/full-frame digital SLRs, or for DSLRs with APS-C/Four-Thirds sensors only. Those made for film and digital are usually pricier; those designed for digital-only are optimised only for sensors. If you're using a DSLR with an APS-C or smaller sensor and never plan to buy a full-frame DSLR, go for a digital-only lens, such as the Canon EF-S range or Nikon's DX.

**WATCH
YOUR FEET!**

The 180° angle-of-view for a fisheye lens means that you have to take great care not to include your feet! Lean slightly forward when using one to prevent feet appearing in the bottom of the frame



Types of telephoto lenses

A telephoto lens is a wise investment and a good addition to your kit bag. However, there are a number of different types of 'tele' available, each with their own advantages, drawbacks and, of course, price tags!

WHY USE A TELEPHOTO/TELEZOOM? Have you ever found yourself too far away from a subject to take a good frame-filling picture? It is often frustrating, but the solution may be as simple as using a lens with a longer focal length. Telephoto lenses are designed to magnify distant subjects, bringing them within photographic range without the need for you to get physically closer to the subject. This is ideal in situations where

it is impractical to get nearer to the subject – for example, timid or dangerous wildlife, or sporting events. However, while the effect can be considered similar to moving closer to the subject, it is not the same. Perspective and depth-of-field are altered through the use of long focal lengths, but providing you know how this will affect the scene or subject you are shooting, this can be used to your advantage.

Short telezoom



A fixed lens simply can't match the versatility of a zoom. Short telezooms have focal lengths of around 50-200mm. They are available in a variety of different ranges: for example, 50-150mm, 55-200mm and 70-200mm. They allow you to choose from a wide variety of focal lengths at a fraction of the cost of buying individual 'primes' covering the same range. They allow for precise framing without the need to alter shooting position. However, a zoom's image quality isn't generally as high as that of a fixed lens and budget telezooms tend to be slow. Many have a variable maximum aperture (eg f/4-5.6), the lens being a stop (or more) slower at the long end of the zoom's range. Although budget models tend to suffer from some lens aberrations, modern zooms offer increasingly good image quality and the best short telezooms are good enough for use by pros. A short telezoom is well suited to a wide variety of subjects, including candid, nature, sceneries, action and still-lives. In fact, it is one of the most useful focal ranges available.

■ **Which short telezoom?** There are a good number of lenses to choose from in this zoom category. If you are on a limited budget, consider the £110 Nikon AF-S 55-200mm f/4-5.6 VR DX or the slightly more powerful Canon EF-S 55-250mm f/4-5.6 IS II zoom, which costs around £150.



ROSS HODDINOTT

Super-telezooms

For an even greater magnification, try a super-telezoom; 70-300mm and 80-400mm are the most popular super-telezoom focal ranges, but they are available with an even more powerful range. For example, Sigma offers both a 150-500mm and 300-800mm telezoom. However, this degree of magnification is only required by a very small percentage of photographers – often those who shoot wildlife or sports. For the majority, a 70-300mm zoom will be more than adequate as, on a camera with an APS-C size sensor, this is equal to a full-frame 105-450mm lens. Super-telezooms are ideally suited to shooting birds and mammals and for taking frame-filling sports shots from a distance. Do bear in mind that many super-telezooms have a relatively slow maximum aperture of f/5.6 at their longest end, which can be restrictive when shooting in low light. Also, be aware that autofocus can prove a little slow and noisy on budget models. However, when you consider that you can buy a 70-300mm for as little as £130, a super-telezoom is a great investment if you want to try your hand at action photography.

■ **Which super telezoom?** The £200 Sigma 70-300mm f/4-5.6 APO Macro DG is a good lens, with a good close-focusing facility. The £350 Tamron 70-300mm f/4-5.6 Di VC USD offers image stabilisation, too.



Fixed telephoto

Prime telephoto lenses have a fixed focal length. While some might consider this a drawback, they are often favoured by professional photographers as they are optically superior to a zoom. A lens under 200mm is considered as a 'short' telephoto and is normally light and compact, so can be used handheld. Also, most boast a small filter thread size, making it cheaper to buy lens attachments for them. Short telephotos in the region of 85mm to 135mm are ideal for portraiture, allowing photographers to work from a distance that isn't uncomfortably close to the sitter. This focal length is also suited to isolating details in sceneries. Focal lengths upwards of 200mm are deemed 'long' telephotos and these lenses are generally big and heavy, making the use of a tripod almost essential. Long telephotos other than pro models also have a slower maximum aperture. While those with fast maximum apertures of f/2.8 or f/4 are best, they can cost thousands; so only pros and those with deep pockets can justify the price. Fast prime telephotos are bulky and heavy, but for wildlife and action photographers, their quality can't be surpassed.

■ **Which prime lens?** For general day-to-day photography, a 200mm is a good, versatile focal length. Consider the Canon EF 200mm f/2.8L USM or Nikon 180mm f/2.8 D IF ED, both priced at around £650.



Anatomy of a telephoto

- 1) Front element** Fast telephotos will have a large diameter front element and filter thread size. To prevent scratches and dirt, consider using a UV or Skylight filter for added protection.
- 2) Manual focus ring** These are normally towards the front of the lens and are quite wide and grooved for grip. It is well worth focusing manually when you want added precision.
- 3) Focus distance** Many lenses have the focusing distance scale marked on the lens's barrel, while some of the higher-spec models have a focusing distance window.
- 4) Tripod collar** Many 'long' telephotos are designed with a mount that features a tripod bush at its base, known as a tripod collar. This allows the lens to be attached to the tripod directly, providing better balance and stability. Many are rotatable, allowing users to switch easily and quickly between horizontal and vertical shooting formats.
- 5) Focus limiter** Some telephoto lenses have a focus limiter switch to prevent the lens from focus 'hunting' across its entire focus range. If a lens is struggling to focus, it will 'hunt' – going back and forth from infinity to the minimum focus. To prevent this, the limiter switch restricts the focal range that the autofocus system will use.
- 6) Image stabilisation** (not shown) Camera shake is a major problem with telezooms due their size and weight, so many boast an integral stabilisation system to reduce the risk of blur.
- 7) Internal focusing (IF) system** (not shown) If you're planning to use filters – particularly a polariser – a telephoto boasting an internal focusing system is beneficial so the lens doesn't rotate.



Understanding focal lengths: Telephotos

The focal length of a lens – referred to in mm – relates to a 35mm film SLR or digital camera employing a full-frame image sensor. Therefore, if your camera has an APS-C-sized sensor, then you are effectively cropping the image and increasing the focal length of the lens. Our table lists below the most popular telephotos and how the effective focal lengths change with different sensor sizes.

Focal length on lens	Cameras Full-frame	APS-H	APS-C	APS-C (Canon)	Four-Thirds
	1x	1.3x	1.5x	1.6x	2x
50mm	50mm	65mm	75mm	13mm	16mm
100mm	100mm	130mm	150mm	160mm	200mm
200mm	200mm	260mm	300mm	320mm	400mm
300mm	300mm	390mm	450mm	480mm	600mm
400mm	400mm	520mm	600mm	640mm	800mm
500mm	500mm	650mm	750mm	800mm	1000mm
55-200mm	55-200mm	72-260mm	83-300mm	88-320mm	110-400mm
70-300mm	70-300mm	91-390mm	105-450mm	112-480mm	140-600mm
100-300mm	100-300mm	130-390mm	150-450mm	160-320mm	200-600mm
80-400mm	80-400mm	104-520mm	120-600mm	128-640mm	160-800mm

Teleconverters

A teleconverter is an optical component that fits between camera and lens and increases the focal length without altering the minimum focusing distance. They are most commonly made in 1.4x and 2x versions – although 1.7x and 3x versions are also produced. Therefore, a 200mm telephoto combined with a 1.4x converter would be equivalent to 280mm, while the same lens coupled with a 2x multiplier would be transformed into a 400mm lens. Converters are relatively inexpensive, light and compact, so are a convenient and economical way to expand the overall flexibility of your kit. However, there are disadvantages to using converters. Firstly, they reduce the amount of light entering the camera by one stop (1.4x) or two stops (2x) respectively. This can prove a problem in low light when the risk of camera shake is increased, and when photographing fast action, when subject blur is more likely due to the resulting slower shutter speed. The other drawback of attaching one is that image quality is slightly degraded, with zoom lenses being affected more than fixed focal lengths. Generally speaking, though, the benefits of using one outweigh the disadvantages. For best quality, opt for one with more elements in the construction. Nikon, Canon and Sigma are among the camera manufacturers that boast converters within their range, but don't overlook independent brands either, like Tokina, Tamron and Kenko as they may suit your budget better. Due to their design, some optics are incompatible with teleconverters, so check your lens instruction manual or ask before buying.



Prime or telezoom

It is the age-old question – why buy a fixed lens, with only one focal length, when a zoom is much more versatile? Here we have listed the 'pros and cons' to both lens types to help you decide which suits your photography best.

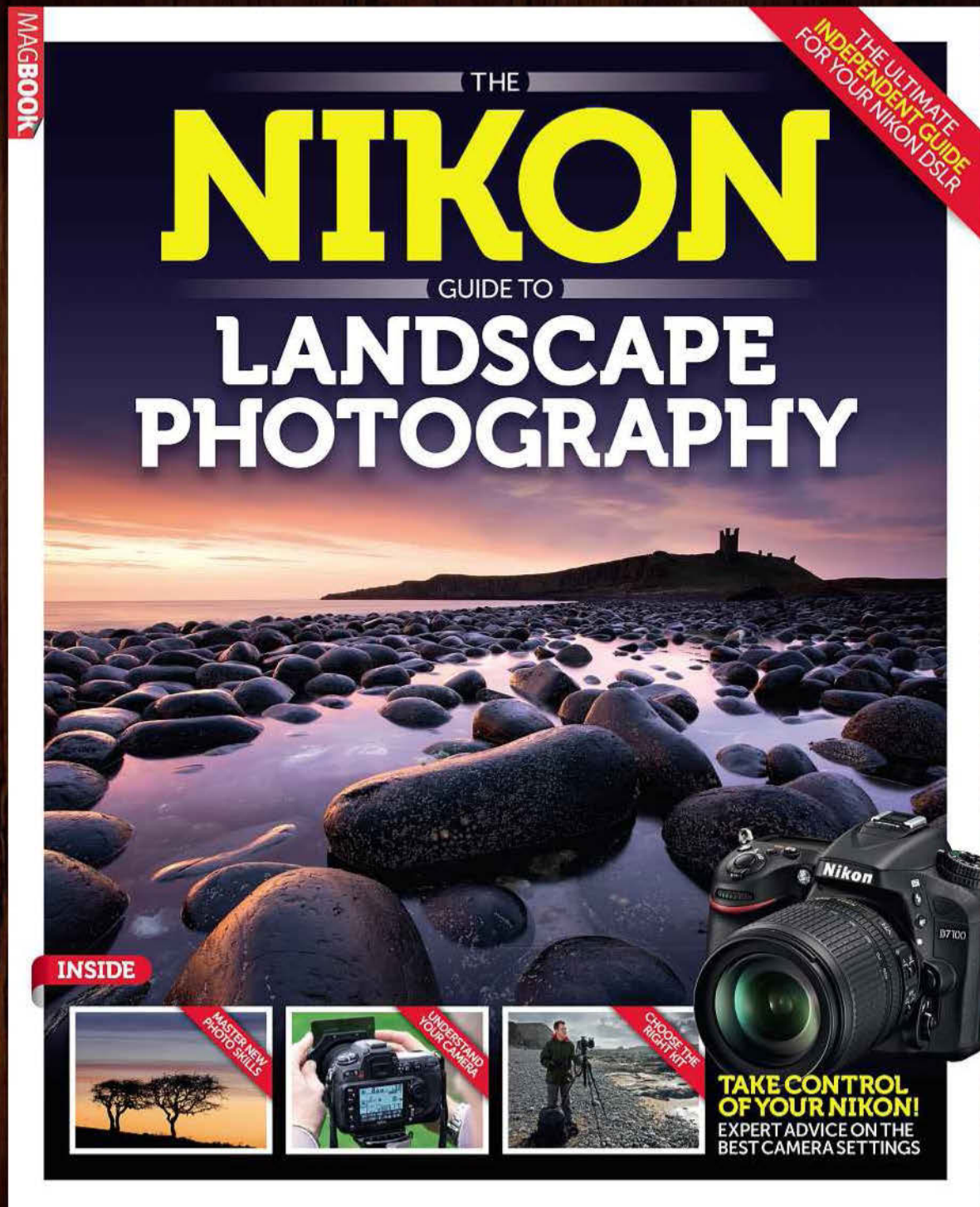
PRIME TELEPHOTO LENS:

- ✓ Simpler optical design means sharper results with better contrast
- ✓ More robust, compact construction
- ✓ The faster maximum aperture provides a brighter viewfinder and better low-light capabilities
- ✓ Will often boast a closer focusing distance than a zoom
- ✗ Restricted to just the one focal length
- ✗ Cost – prime lenses are typically more expensive than zoom lenses

TELEZOOM LENS

- ✓ Covers a range of focal lengths, so provides greater versatility
- ✓ Replaces the need to carry several different fixed lenses, meaning that there is less for you to lug about
- ✓ Lots of flexibility at a very good price
- ✗ Not as good optically as a fixed lens, particularly towards the edges of the frame
- ✗ Maximum aperture slower than a fixed lens
- ✗ Paradoxically, zooms can offer too much choice – complicating framing and composition

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BUDGET PHOTO

While the general rule is that the more you spend, the better the quality, the fact is there are many low-cost products claiming to offer us a chance to expand our creative options and capture images that belie their low price tag. In this section, we bring you many of the *Budget Photo* finds that *Digital SLR Photography* magazine discovered deliver on their promise of allowing fantastic photography on a limited budget



Theme: 50mm f/1.8 standard lens**Budget:** £150**Challengee:** Daniel Lezano

NOTHING CONTRIBUTES TO the versatility of your camera outfit as much as lenses, which is why camera systems based around interchangeable lenses have

always been so popular. Unfortunately, our aspiration to buy new optics and increase our creative opportunities is often tempered with the realisation that to do so, we have to be prepared to spend hundreds to buy something of decent quality. Or do we?

For this budget suggestion, we're looking at a lens that has been available for decades and, in truth, has changed very little in that time. The 50mm f/1.8 is a lens that had its heyday way back in the last quarter of the 20th century but saw its popularity decline rapidly with the emergence of standard zooms. However, in the last few years its appeal has increased once again as new generations of photographers have discovered its many benefits. If you are not already one of the converted, then we hope this article is enough to inspire you want to make the humble 50mm the next lens to find its way on to the front of your camera.

The 50mm has long been described as the 'standard lens' as it was the one that came as standard when you bought an SLR camera. We're talking about back in the era of 35mm film SLRs, when digital cameras were still the stuff of sci-fi. In fact, 50mm lenses were at their peak before autofocus even came on the scene.

So what is it about the 50mm lens that we think makes it such an attractive proposition? There are several factors, but let's start with the most obvious – the price. The 50mm f/1.8 is one of the cheapest

DID YOU KNOW?

The angle-of-view of a 50mm lens is around 46°, which is similar to that of the human eye

lenses you can buy. While a low price tag usually signifies a product that is inferior in quality, this isn't the case here. Much of the reason why it's so affordable is because the lens itself is inexpensive to manufacture, in the main due to the relatively simple optical construction. Don't let the low price fool you into thinking that images taken on a 50mm won't be sharp – you couldn't be further from the truth.

The 50mm lens is a prime lens, which means that it only offers one focal length, unlike zoom lenses which cover variable focal lengths, resulting in a far more complex optical construction. The relative simplicity behind the design of the optics for prime lenses means that they are able to offer not only very high image quality in terms of sharpness, but they're also far better at minimising optical problems such as distortion, vignetting and colour fringing. The result, therefore, is that despite many 50mm lenses being very affordable, the



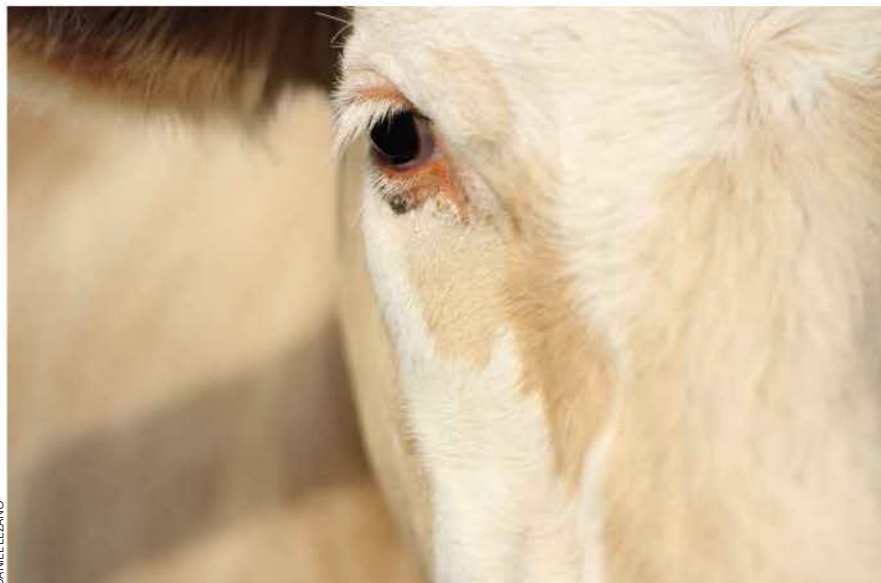
Above: I've been using 50mm f/1.8 lenses for nearly 30 years. Isn't it about time you started?

Right: Having a fixed focal length forces you to look for decent images in everyday locations.

Below: This close-up abstract of a bull's eye was taken wide-open so only the eye is sharp.

image quality it produces is superior to what you can expect from zooms.

There is another major optical advantage of the 50mm lens – its very fast maximum aperture of f/1.8. In an age where 18–55mm kit zooms have a maximum aperture of f/3.5–5.6 and 'fast' f/2.8 standard zooms cost £1,000+, such a wide aperture can't be ignored as it has so many advantages. For starters, the viewfinder is much brighter, which is a real benefit when shooting in low light. In these conditions, the fast aperture also means faster shutter speeds are available, so you're able to shoot handheld. But the biggest benefit of all is that when shooting at f/1.8, you can achieve a beautifully shallow depth-of-field that allows you to limit the zone of sharpness to mere millimetres, allowing you to capture »



DANIEL LEZANO

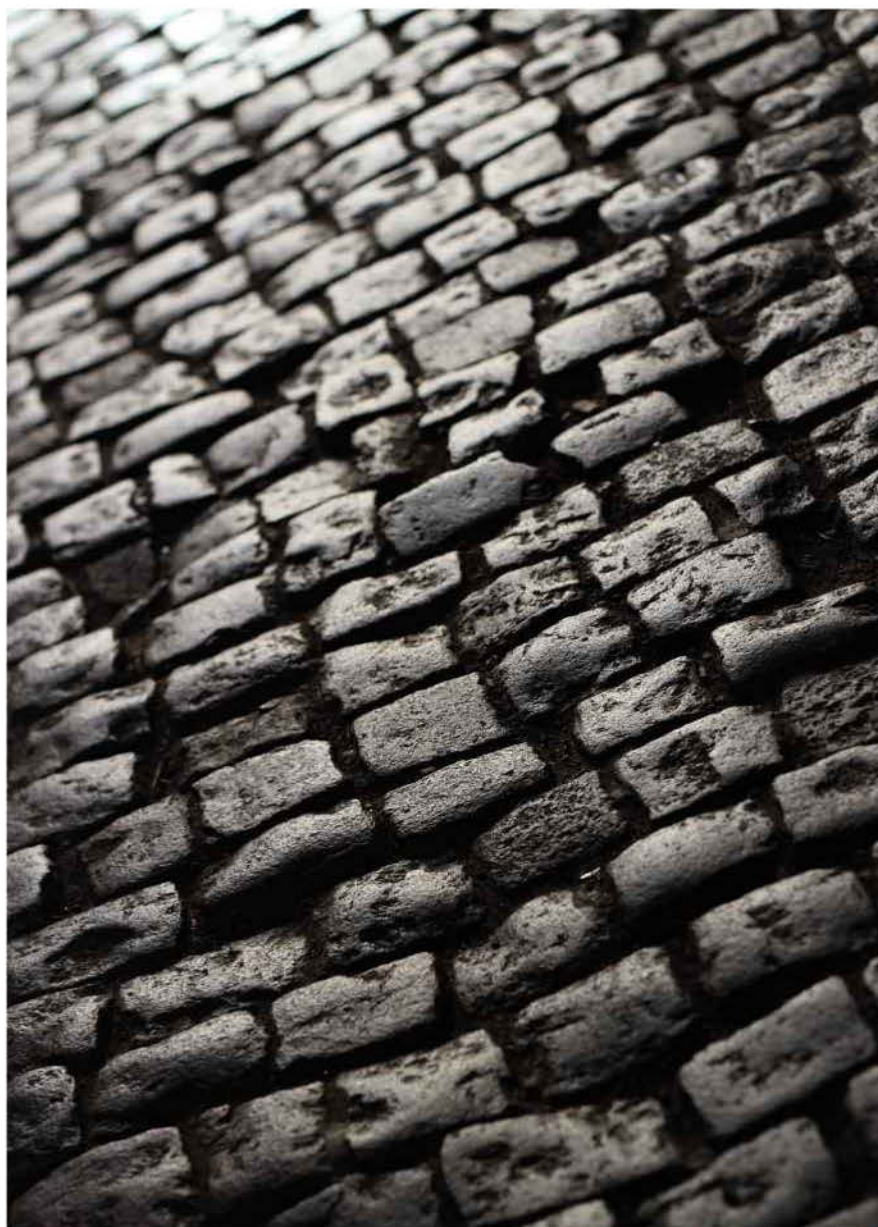
Why I love the 50mm f/1.8...

JORDAN BUTTERS



"The 50mm f/1.8 is my 'go-to' lens. If I want to travel light or I'm heading out unsure what I'll end up shooting, it's my first choice. I find that being restricted to a fixed focal length makes me think more about composition. If I need to zoom in or out, I just use my legs!"





DANIEL LEZANO

Budget standard lenses

■ CANON EF 50MM F/1.8 II

Guide price: £130
Street price: £85
Effective focal length (APS-C): 80mm
Optics: Six elements in five groups
Filter thread: 52mm
Minimum focus: 45cm
Aperture range: f/1.8 to f/22
Size: 68.2x41mm **Weight:** 130g



This is arguably the biggest bargain in the world of lenses, costing around £85 new and around £50 for mint condition used. It's been around for decades and the AF is slower and noisier than modern Canon lenses, but the optics won't disappoint. Got a Canon EOS? Get one of these!

■ NIKKOR AF 50MM F/1.8D

Guide price: £135
Street price: £109
Effective focal length (APS-C): 75mm
Optics: Six elements in five groups
Filter thread: 52mm
Minimum focus: 45cm
Aperture range: f/1.8 to f/22
Size: 63x39mm **Weight:** 155g



The older and more affordable of the two Nikon f/1.8 standard lenses. It's small and lightweight, making it the perfect travel companion. The AF is excellent and the optics are first-rate, too. If you can't afford the more expensive Nikkor, don't worry – this budget beauty won't let you down.

■ NIKKOR AF-S DX 35MM F/1.8G

Guide price: £210
Street price: £150
Effective focal length (APS-C): 52.5mm
Optics: Eight elements in six groups
Filter thread: 52mm
Minimum focus: 30cm
Aperture range: f/1.8 to f/22
Size: 70x52.5mm **Weight:** 200g



This high-quality lens is designed for use with Nikon DSLRs with APS-C sensors only, giving it a near-identical focal length to 50mm lenses used with full-frame. It's ideal if you prefer the wider coverage to shoot general scenes – for portraits, go for one of the Nikon 50mm lenses.

Two of the more expensive 50mm lenses...

Not all 50mm f/1.8 lenses fall into the budget category, but are still well worth considering.

■ PENTAX SMC DA 50MM F/1.8

Guide price: £250
Street price: £150
Effective focal length (APS-C): 75mm
Optics: Six elements in five groups
Filter thread: 52mm
Minimum focus: 45cm
Aperture range: f/1.8 to f/22
Size: 63x38.5mm **Weight:** 122g



This lens was only announced by Pentax a few months ago and we're yet to try it. With a guide price of £250, it's significantly more expensive than the other brands, but we've included it here to make Pentax users aware of it. That said, as we went to press, its price has seen a significant drop to £150 or less.

■ NIKKOR AF-S 50MM F/1.8G

Guide price: £200
Street price: £179
Effective focal length (APS-C): 75mm
Optics: Seven elements in six groups
Filter thread: 58mm
Minimum focus: 45cm
Aperture range: f/1.8 to f/16
Size: 72x39mm **Weight:** 185g



While we've excluded this lens from the budget bunch, it's still very reasonably priced. Only launched this year, it boasts improved AF and better quality optics than the budget option. If you can afford to spend the extra, you'll be the owner of arguably the best 50mm f/1.8 standard lens currently available.

■ SONY DT 50MM F/1.8 II SAM

Guide price: £160
Street price: £150
Effective focal length (APS-C): 75mm
Optics: Six elements in five groups
Filter thread: 49mm
Minimum focus: 34cm
Aperture range: f/1.8 to f/22
Size: 70x45mm **Weight:** 170g



Sony Alpha users have this compact and inexpensive option, which has modern styling. AF is smooth but a tad noisy and prone to occasional hunting. Once you've stopped down to f/4, sharpness is good, but at f/1.8 it's not so hot! Sony also makes a 50mm f/1.8 lens for its NEX CSC range.



LEE FROST

Why I love the 50mm f/1.8...

LEE FROST



"When I travel I often shoot handheld in low light – that's where the 50mm f/1.8 comes into its own. It's feather-light, the fast maximum aperture allows me to set a decent shutter speed and for the money (my Canon 50mm cost under £80 new), it's razor-sharp. The focal length is ideal for all kinds of subjects and the close focusing allows me to fill the frame with small details."



images where the separation of subject from its backdrop isn't possible with lenses boasting smaller maximum apertures. Of course, care needs to be taken with focusing when shooting wide open to ensure the area you require in focus is sharp – even a small error will ruin the result!

In the days of 35mm film, the 50mm was incredibly popular for shooting portraits as its perspective and shallow depth-of-field both worked together for very flattering portraits. In an age where APS-C sensors are now so popular, the use of a 50mm f/1.8 lens for portraits makes even more sense than ever. The effective focal length of 75mm (80mm on a Canon) is perfect for shooting portraits – when you consider the 85mm f/1.8 lens that has proven so popular for so long with fashion and portrait photographers costs around £260, it's impossible to argue against the 50mm lens as a very affordable alternative.

And it's not just portraits the 50mm is well suited for. Its very small size and weight make it the perfect companion whether it's on the front of your camera or in your kit bag, so if you're keen on travel photography, it's definitely one you should consider. While the focal length is not ideal for shooting landscapes, it can be used as a very good general-purpose lens – the lack of distortion makes it suitable for shooting urban scenes and architecture, while its small size and fast aperture is perfect for

candid shots and shooting from the hip. We've already touched on it being suitable for low-light shooting, so it's a great choice when shooting interiors of large buildings like churches and cathedrals.

Most 50mm lenses have a minimum focus around 45cm and a magnification of around 1:6 (0.16x), so they're not suitable for macro photography but are still very good for shooting close-ups, whether that's wild flowers or still-lives. And should you be a fan of wildlife, you'll find it produces very nice animal portraits as long as you can get close enough to your subject.

Of course, prime lenses by their nature are less versatile than zooms in the sense that they have a fixed focal length. So, if you find you need a wider viewpoint or should the subject be too small in the frame, there's no zoom ring to turn to make everything better.

Instead, you're forced to physically move towards or away from the subject until you're satisfied with how the scene is framed. If you've only ever used zoom lenses, the concept of walking to perfectly compose a scene may come as a bit of a shock to you, but it's not as bad as it sounds – honest! Of course, there may be situations where it's impossible to frame the scene as you want – for example, you may be shooting interiors or the location may prevent you moving to your desired viewpoint – but most of the time, a short walk is all that's required to frame the scene

BUYING ADVICE

You'll find many used 50mm f/1.8 lenses for sale, so check out local photo dealers, our adverts in Test Centre and eBay for bargains!



JORDAN BUTTERS

to perfection. With use, you'll quickly start to mentally preview potential scenes with the 50mm in mind; having a fixed focal length lens with a similar coverage to the human eye makes this easier than you may think. You'll start to know where you need to position yourself to capture a candid, a portrait or an urban scene without even having to raise your camera to your eye. You'll also begin seeing new potential in the scenes around you, specifically because you're looking to capture it with the 50mm lens. I know this might sound like nonsense, but hopefully others who have used standard lenses for years will verify it – the restriction of not having a zoom is an aid to helping you develop an eye for better compositions. A 50mm was the only lens I owned for a couple of years when I first started taking pictures on an SLR, and it forced me to look harder for pictures. I suggest you buy one, fit it on your camera, hide away your other lenses for a couple of weeks and discover what's possible with only the 50mm. Placing this restriction on the lens you use is a great way of forcing yourself to try harder to take better pictures. The 50mm may be limited to a single focal length, but hopefully it will help you widen your world of photographic possibilities. 🌟

Above: Taken at f/1.8, this beautiful daylight portrait is enhanced by the fall-off in sharpness. **Top left:** Shooting handheld in low light is easy thanks to the 50mm's fast maximum aperture.

Manual focus lenses

The popularity of 50mm lenses over the last few decades means many are available on the secondhand market. As well as current and discontinued AF models, you'll also find a huge number of manual focus lenses for non-existent fittings, such as Canon FD, Olympus OM or M42 screw. These can be picked up for as little as £20 and fitted to your DSLR via an adaptor, which costs between £15-20. You'll also find manual focus lenses for the current Nikon and Pentax mounts. With these lenses, the camera's functions are limited – often to manual exposure mode, f/stops are changed via the aperture ring on the lens and focus is manual too. If you can live with these restrictions, go for it, but with used AF lenses (which retain all functions) starting at around £60, we'd say opt for this slightly more expensive option.



Alternative 'standard' lenses

The 50mm f/1.8 isn't the only prime lens that you can adopt as your 'standard'. Two other options are available, which we've described below with their pros and cons.

50MM F/1.4 LENSES

Many enthusiasts and professionals that start with the 50mm f/1.8 upgrade at some point to a 50mm f/1.4. These lenses offer a one-stop benefit and superior optical quality. They're larger and heavier due to the faster glass, but the main drawback is the big hike in the price. Unless you plan to make money from your images, we'd say stick with the f/1.8 lens. Most marque brands offer an f/1.4 optic, as do independent lens manufacturers. There is even a 30mm f/1.4 lens available for APS-C users. Below we provide a price list of the most readily available 50mm f/1.4 lenses.



- **Canon EF 50mm f/1.4 USM**
Guide price: £450 / Street price: £290
- **Nikon 50mm AF f/1.4D**
Guide price: £300 / Street price: £250
- **Nikon 50mm AF-S f/1.4G**
Guide price: £375 / Street price: £280
- **Pentax SMC FA 50mm f/1.4**
Guide price: £380 / Street price: £320
- **Sigma 30mm f/1.4 EX DC HSM**
Guide price: £450 / Street price: £249
For: Canon, Nikon, Pentax, Sony, Sigma
- **Sigma 50mm f/1.4 EX DG HSM**
Guide price: £450 / Street price: £365
For: Canon, Nikon, Pentax, Sony, Sigma

- **Sony SAL 50mm f/1.4**
Guide price: £370 / Street price: £300

PANCAKE LENSES

Pancake lenses are ideal if you want the most compact possible lens. Various focal lengths are available from wide-angle to short telephoto, and these include a small number of pancake 'standard' lenses.



While the size is an advantage, optics in general don't quite match conventional lenses for sharpness and in most cases the maximum aperture is not as fast.

- **Canon EF 40mm f/2.8**
(Effective focal length with APS-C: 64mm)
Guide price: £370 / Street price: £150
- **Olympus Zuiko 25mm f/2.8**
(Effective focal length: 50mm)
Guide price: £230 / Street price: £200
- **Panasonic Lumix 20mm f/1.7**
(Effective focal length: 40mm)
Guide price: £370 / Street price: £270
- **Samsung EX 30mm f/2**
(Effective focal length: 45mm)
Guide price: £250 / Street price: £230

Theme: Macro conversion lens**Budget:** £50**Challengee:** Daniel Lezano

MACRO PHOTOGRAPHY is more popular than ever. This has much to do with the fact that more and more high-quality products are becoming available at affordable prices, allowing photographers the chance to try out high-magnification close-up photography for the first time.

We've tried out a variety of close-up kit in the last year or so, from the ridiculously cheap Gump extension tubes to the brilliantly affordable Ring 48 LED ringlight (featured on p140), which all goes to show that you don't need to spend very much to have the kit you need to take great close-ups.

This budget test centres around a query from reader Paul Malloy, who wonders if a Raynox macro attachment is worth the extra cost over close-up filters. We've never tried out the Raynox before, so in order to provide the definitive answer, we ordered one, along with a set of close-up filters, to see which represents the best buy.

The Raynox is an intriguing bit of kit. It's effectively a close-up filter with a clip-on mount that allows it to be fitted to a variety of lenses. Two versions are available: the 4.8 dioptre DCR-150 and the eight-dioptre DCR-250 – the latter being the model we're reviewing here. The design of the Raynox offers a couple of distinct advantages over standard close-up filters. The first is that the lens optics are technically far superior, boasting three elements and anti-reflection coatings on all external surfaces. Budget close-up filters generally only have one element that lacks



any coating. This should mean that the Raynox is sharper from the centre right through to the edges. The coating should also result in better contrast and less colour fringing. The other benefit is that the clip allows the Raynox to be used on lenses with filter threads from 52mm to 67mm, rather than being limited to one particular filter thread size as with standard close-up filters. These advantages come at a price, though, with the Raynox costing £44 as opposed to less than £20 for a set of close-up filters. Also, with the Raynox you're limited to one magnification (eight dioptres in the case of the DCR-250); with a set of close-up filters, you have a choice.

Visit your local photo dealer or websites like eBay and Amazon and you'll discover a variety of close-up filters to choose from. We opted for a set from Polaroid that cost £13 including postage. The set includes a

Above: The Raynox can be used with the lens set to AF or M; I found both methods worked well. **Right:** To show the close-up capabilities of the Raynox, this shot was taken on a Canon 28-80mm at 80mm and set to minimum focus.

Below: Spend an afternoon in the garden with the Raynox and you'll discover the potential for capturing great close-up images, such as dandelion clocks and abstracts of flowers.

+1, +2, +4 and +8 dioptre filter (which can be combined for added power), all supplied in a very neat nylon wallet. We opted for a 58mm filter size to fit our lenses, although all sizes from 37mm to 77mm are available.

When shooting close-ups with the Raynox (or close-up filters), you can leave the lens on AF and shoot as normal. Because these accessories allow you to get closer to the subject than normal, the result is that you capture images that boast a much higher magnification than a standard lens can





"Because these accessories allow you to get closer to the subject than normal, the result is that you capture images that boast a much higher level of magnification than a standard lens can achieve"

achieve. However, you need to be aware of a couple of constraints. The first is that with the Raynox attached, your lens is incapable of focusing at longer distances; in other words, you're limited to close shooting distances only. The other is that you need to avoid using wide-angle focal lengths with the Raynox as it can lead to severe vignetting, because it's physically smaller than the front element of some lenses. This only occurs when used with lenses with wide-angle focal lengths, including kit zooms. Our comparison set on the next page illustrates an extreme example of this. The Raynox website states you should stick to focal lengths of 50mm (full-frame) / 75mm (APS-C) to avoid signs of darkening at the edges and our tests verify this.

Because the Raynox uses an adaptor to clip it to lenses, you're free to experiment with different focal lengths of lenses, as long as filter threads are between 52mm to 67mm. You're best off using it with prime lenses rather than zooms to maximise image quality, but you should take test shots with all

suitable lenses – at different focal lengths if they're zooms – and see how results vary.

For this article, I predominantly used two low-cost zooms – the latest Canon EF-S 18-55mm IS STM kit zoom and a 15-year-old Canon EF 28-80mm lens. The camera was the entry-level Canon EOS 700D.

While autofocus is convenient for general photography, it's not always ideal when shooting at such close focusing distances, so I'd strongly suggest you consider switching the lens to manual focus and taking control yourself. With certain subjects like flowers, using manual focus allows you to choose exactly where to focus – leaving AF switched can result in the wrong area of the flower being sharply recorded due to the AF sensor locking on to the closest part of the subject.

If you've never used manual focus, don't be put off; you'll find it easy to use and the camera's AF confirmation icon in the viewfinder (as well as the AF beep) will activate when you have perfectly focused on the subject. »

Raynox DCR-250



■ Raynox DCR-250 Super Macro Conversion Lens

Price: £43 from Amazon (price includes Amazon Prime delivery)

Optical construction: Three lenses in two groups, all coated optical glass

Magnification: Eight dioptries

Design: Lens element with 49mm front filter thread and 43mm rear thread, which attaches to a universal adaptor that clips to lenses from 52mm to 67mm

Supplied accessory: Storage case, caps

Size: 53x18mm

Weight: 60g

Website: www.raynox.com

Shooting close-ups

- 1) Take your time to ensure perfect focus as depth-of-field is very limited with close-ups
- 2) Keep an eye on exposure times to avoid shake – increase the ISO as well as adjusting the aperture
- 3) Sharpness is best at the centre, so compose your subject so the focal point is in the middle of the frame
- 4) If shooting insects, aim for a morning start when they're more docile
- 5) Zooms offer versatility in composition, but use prime lenses for the ultimate in quality
- 6) Try a variety of lenses as each offer different magnification ratios and focusing distances
- 7) Keep a silver/white reflector handy to bounce light onto your subject
- 8) Minimise aberrations by using mid-aperture settings, such as f/6.3 to f/8
- 9) Don't always try for maximum magnification – sometimes less is more in terms of visual impact
- 10) Close-up filters can be combined but doing so will degrade image quality
- 11) Experiment with focusing techniques – using manual focus and physically moving forwards and backwards works well



Above: Using the Canon EF-S 18-55mm at 18mm includes the Raynox in the image. There is no sign of this problem when the lens is at 45mm.

Above right: Shot from the same position, these images show the effect of using the Raynox and Polaroid close-up filters on the Canon 18-55mm.

The method I've found easiest to use is to set the lens to manual focus and its minimum focusing distance. I then physically move closer and further away until the subject appears sharp in the viewfinder. This approach is obviously for when you are handholding the camera. If you're using a tripod, the process is more laborious as you physically have to shift its position. If your tripod has a centre column that can be placed in a horizontal position, your life is made a little easier, as you can set your camera up so that it's effectively at one end of an 'arm', meaning you only have to pull the column forwards or backwards to achieve focus.

These two methods assume you want to maximise magnification, but in reality you'll find that you can get so close with



the Raynox that you'll often not push it to its limits to compose a nice image. As you can see from the butterfly image on the previous page, while the Raynox allows you to capture detailed images of the insect's eye, moving further back sets it against a colourful backdrop for visual impact.

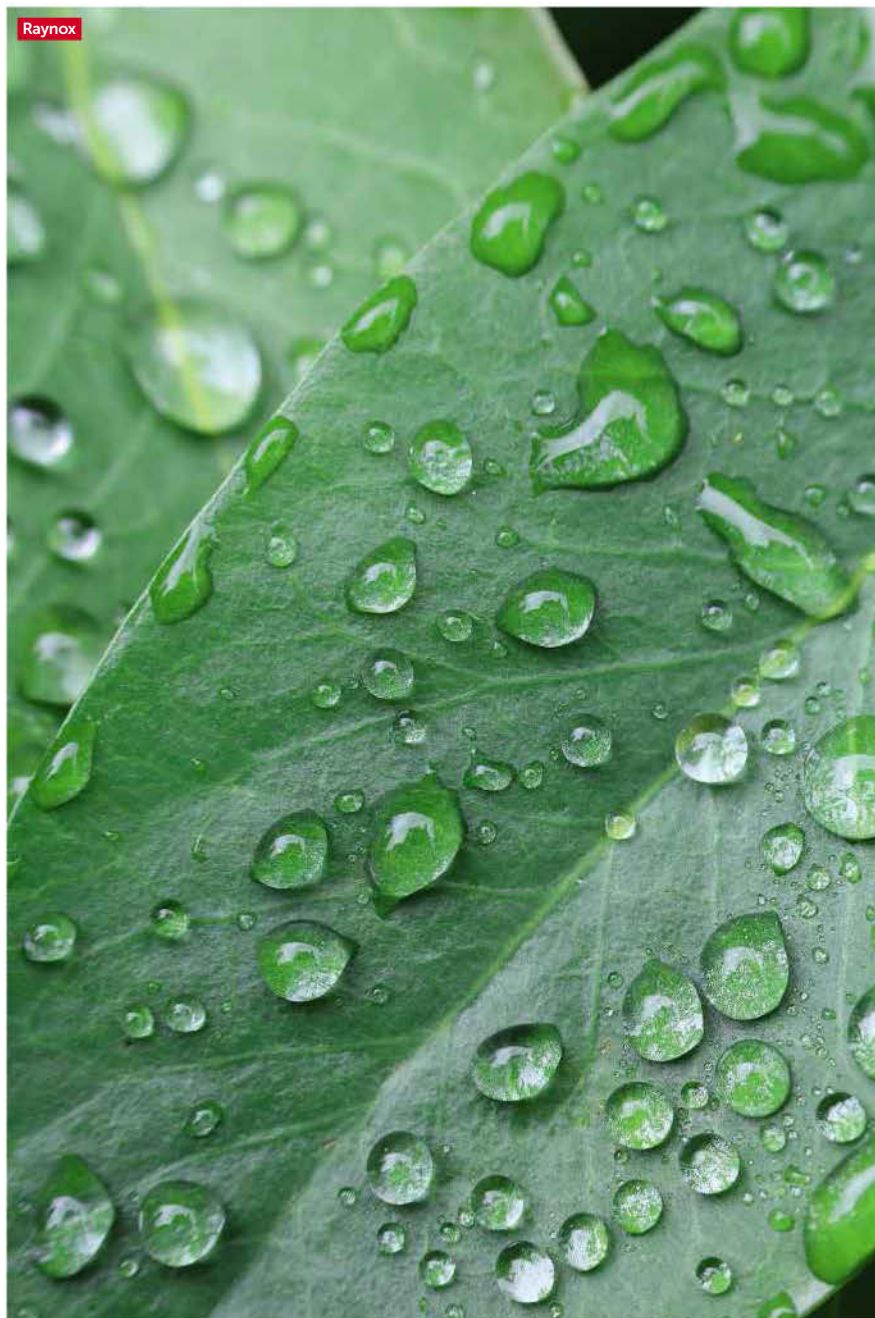
As well as the challenges faced with achieving maximum magnification, another problem you will face is the close shooting distances you'll be working with. With the Raynox fitted, you can get within a few centimetres of your subject, so there is a real risk of blocking light from reaching your scene, or of scaring away flighty creatures.

It seems that I've focused mainly on the

restrictions rather than the benefits of the Raynox, but that's simply because it's a relatively unknown product, so I wanted to cover its use before moving on to its performance. Thankfully, in this respect, I've pretty much nothing but praise for the Raynox DCR-250. The quality of the images produced using the Raynox is excellent, with decent resolution throughout the image area and no major evidence of a drop-off in image sharpness, even towards the edges. While low-powered close-up filters like a +2 and +4 retain good sharpness, more powerful offerings like a +10 show a marked drop in quality, so the performance of the +8 Raynox stands out as exceptional.

HANDY HINT

Rather than using the focusing ring to lock on to your subject, try setting your lens to its minimum focusing distance and moving backwards and forwards in relation to your subject until you have sharp focus.



“The quality of the images produced using the Raynox is excellent, with decent resolution throughout the image and no major evidence of a drop-off in image sharpness, even towards the edges”

I also really like how the clip-on adaptor allows it to be removed and replaced quickly. This proves useful when you want to quickly change lenses and transfer the Raynox from one to the other, but also when you quickly want to switch from shooting high-magnification close-ups to more general scenes without it in place.

While around £40 may seem a lot to pay for a +8 dioptre close-up lens when kits with four different strengths of close-up filters

are available for under £15, the fact is that the extra expense is worth it. The difference in image quality is markedly better, while the universal adaptor effectively means the Raynox covers five of the most popular filter sizes, giving it the versatility to be swapped between lenses of different sizes. Given the choice, I'd definitely stump up the extra and choose the Raynox DCR-250 over a set of close-up filters. In terms of flexibility and quality, it's hard to beat. 📸

Other budget options



■ BV & Jo manual extension tubes

Price: £9.99 (including delivery)

Visit: www.amazon.co.uk

Available in most popular lens fittings, these tubes lack electronics so you need to be prepared to use manual exposure mode and focus manually, too. While this does make them a tad tricky to use, they're a very affordable entry-point into macro photography.



■ Polaroid close-up filters

Price: Sets from £13 (37mm) to £20 (77mm). Price includes Prime delivery

Visit: www.amazon.co.uk

There are various sets of budget close-up filters available from brands like Zeikos, Borwin and Neewer. The Polaroid kit is supplied in a smart padded nylon wallet and includes four close-up filters made up of +1, +2, +4 and +10 dioptries.



■ Kenko DG Auto Extension Tubes

Price: £140

Visit: www.intro2020.co.uk

These set of auto extension tubes boast electronic contacts so that they retain your camera's metering functions. You'll even retain AF depending on your lens and camera. The set includes 12mm, 20mm and 36mm tubes, and are available in Canon, Nikon and Sony fittings.

Theme: Macro lighting**Budget:** £50**Challengee:** Daniel Lezano

It's good to know that our *Budget Photo* series that features in regular issues of *Digital SLR Photography* magazine has built up enough interest among our readers that we've received a number of ideas for what to cover. Some have proven a little on the bizarre side, most notably the request to build a budget underwater housing from an old fish tank (seriously?), while the majority of suggestions have taken on a far more practical nature. This budget idea came from reader Geoff Foote, who asked that we try out macro LED ringlights (as opposed to ringflash).

A ringlight is a relatively new innovation in the world of photography. It looks much like the ringflash units that have long been used by close-up enthusiasts and attach the same way – via the lens's filter thread. While its purpose is also to illuminate nearby subjects, it has a number of notable differences to ringflash (see panel over the page), the main one being the lights remain constantly on, rather than flashing at the moment of exposure.

This is because rather than housing flash tubes, the ringlight is fitted with several small white LED lights, much like you'll find in pocket torches. These produce a cleaner, brighter light than the traditional light bulb, while also consuming less power and lasting far longer. They're also relatively inexpensive to produce, which is why LED torches can be picked up from a DIY store for £1 and why ringlights sporting 48 of the bright little blighters can be bought for under £30.

Whether or not these budget lights are worth investing in is what this article sets out to discover. With dedicated ringflashes costing anywhere upwards of £300, you're set to make a substantial saving if our Ring 48 unit proves to be a star performer.

We ordered our unit from Amazon and were pleased to find it was delivered within a couple of days. Costing less than £30, you'd be forgiven for thinking this is the most basic of lights but, in truth, it has more than you may have bargained for. For your £28 (including delivery!), your kit contains the ringlight, the hotshoe-mounted power controller, a mains plug and six adaptor rings that allow you to fit the ringlight to lenses with filter threads ranging from 49mm to 67mm.

You've two options when it comes to power – you can use two AA alkaline or rechargeable batteries when out and about, or when indoors switch to using the supplied three-volt mains adaptor instead if

DID YOU KNOW?
Dedicated ringflash units start at around £300, so an LED ringlight is a far more affordable lighting option for close-ups!

Above: My choice of outfit for this *Budget Photo* challenge was the Canon EOS 550D with Tamron 60mm f/2 macro lens. The Ring 48 attached to the front via the 55mm ring.

Right: A gerbera with a green binder behind it was well lit by the LED ringlight.

you so wish. This isn't a bad choice – looking around at other models, many use battery-power only.

The ringlight is made up of 48 small white LED lights, which remain constantly lit – in other words, there is no option to use them as a flash. Your only control of the light output is a switch on the side, which allows you to have all 48 LEDs lit, the 24 on the left side of the ring, or the 24 on the right side.

The power controller is a unit that is attached to the camera via the hotshoe mount. On one side are two sockets – an Output socket at the top that connects to the ringlight and the DC-in socket that connects to the mains power via the supplied adaptor. On the opposite side is the on/off switch that also selects

between battery and mains power, with a red light that illuminates while the unit remains switched on.

Compared to the better-known marque ringflash units, our Ring 48 model is very basic. The Canon MR-14EX, for example, boasts twin modelling lamps and flash, a far higher power setting, E-TTL wireless autofocus and an illuminated LCD panel to make it far easier to use. You prefer one of these, do you? Then feel free to part with £460 and be on your merry way...



Ring 48 Macro LED

Guide price: £28

Number of LED lights: 48

Variable control:

All, left or right

Weight: 165g

Supplied accessories:

Battery pack, power controller, ring head, charger, six adaptor rings (49mm, 52mm, 55mm, 58mm, 62mm, 67mm)



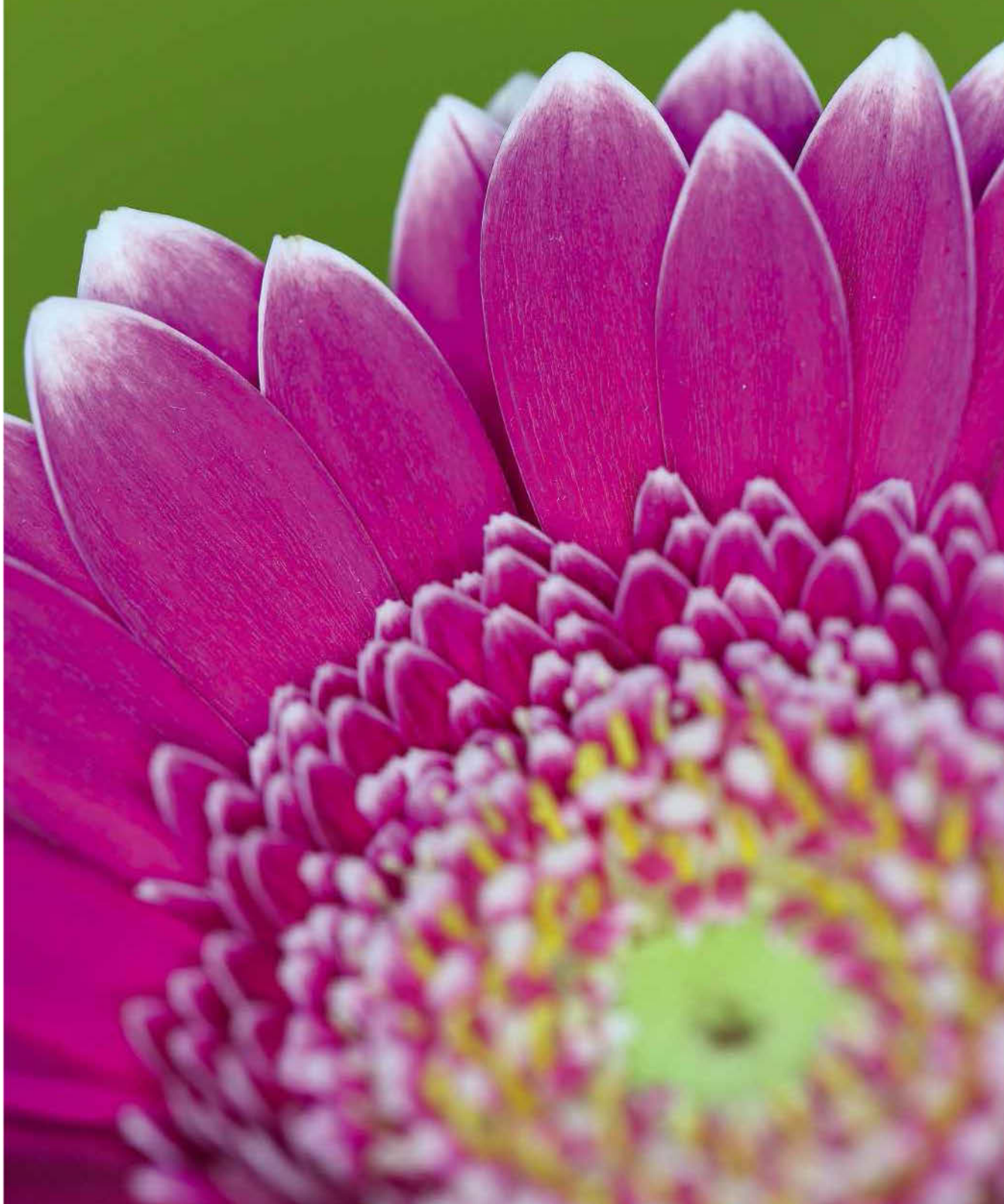
You'll find this ringlight under various guises (Ring 48 and Neewer to name but two) at under £30. You can't really argue with the price considering the adequate build quality and useful, if limited, range of features. If you can live with its limitations, you'll find it to be a fairly versatile light for close-up photography.

Decided to hang around now to learn more about the Ring 48? Good. Then let's carry on and find out just what is possible (and what isn't!) with our budget-priced mail-order ringlight.

The primary purpose of this type of light is for use in close-ups and that's where we'll be focusing our attention in this article. However, as the sales blurb and instructions state, the Ring 48 is also suitable for portraits. I was very dubious about this statement, to be honest, as I assumed the low power of the unit would mean you would need to be close to the subject to provide sufficient illumination and at this close range, 48 LED lights are sure to prove very uncomfortable for the subject. »

Bright spark

Great results can be achieved with the ringlight, especially for abstract shots of petals.





However, in the interest of editorial integrity, I decided that before using it for close-ups, I'd give it a try shooting a head and shoulders portrait.

For all the images, I set the camera to aperture-priority mode at f/4 with the ISO rating set at 400. I'd then make adjustments to both to ensure the shutter speeds avoided shake and to vary depth-of-field. For the portraits, I enlisted team member Donna to sit in the studio and face the prospect of 48 LED lights at close quarters. As it turned out, the brightness of the LEDs were better than expected, meaning I could shoot from a reasonable distance and still capture a head and shoulders portrait while handholding the camera. Therefore, while bright, I was able to take a number of frames before the lights proved too dazzling. As for the results? Well they were



Top left: Portraits are possible although the harsh, bright light from the LEDs isn't ideal!

Top right: Shooting a rose from further away slightly reduces the harshness of the LED lights.

Above: I placed the ringlight behind the leaves to reveal their intricate structure and colour.

Macro: ringlight v ringflash

A macro ringlight and macro ringflash are fairly similar, but they do have some major differences. We've outlined the main ones below, along with the advantages and disadvantages of each type of lighting.

MACRO RINGLIGHT

These use a set of bright LED lights that are arranged in a similar housing to a ringflash. The main difference to a flash is the lights are on permanently, which limits their working range and drains batteries. They offer some basic lighting control. Most are daylight-balanced.



- ✓ Very affordable
- ✓ Fairly versatile
- ✓ Battery & mains power
- ✗ Limited range
- ✗ Limited lighting control
- ✗ Too harsh for high quality portraits

MACRO RINGFLASH

As its name suggests, this pumps out a flash burst when you press the shutter with TTL flash control ensuring accurate exposures. Modelling lights are used to aid focus and most allow a degree of lighting control. For subtle lighting and ultimate control, it's the best choice.



- ✓ Sophisticated lighting control
- ✓ More powerful than ringlights
- ✗ Far more expensive

LED ringlight: Top tips

Use the following tips to help you take better pictures with your LED ringlight

1) Set your camera to aperture-priority

Select the aperture you want to use and keep an eye on the shutter speed – increase the ISO rating if shake is a risk

2) Make sure you switch it off!

There is no safety shut-off, so switch the power unit off to preserve battery life

3) Watch out for reflective subjects

Metallic objects cause strong hotspots

4) Use mains power whenever possible

Plugging the ringlight into the mains may seem inconvenient, but it means you don't have to worry about draining batteries

5) Experiment with reflectors

Use a handheld reflector to help shape the ringlight's output to improve results

6) Keep spare batteries handy!

A fresh set of AAs only manages between 1-2 hours, so ensure you have spares

7) Use the ringlight off the lens! Get creative with lighting by using the ringlight behind or to the side of the subject

better than expected and not too far off what you could achieve with a ringflash adaptor like the Orbis or RayFlash.

I used the excellent Tamron 60mm f/2 macro lens for the portraits and close-up images in this article. With an effective focal length of 96mm on my Canon EOS 550D, it was ideal for portraits as well as macro.

With the portrait test out of the way, it was time to concentrate on the primary use of the ringlight: close-up photography. Unfortunately the wet weather meant I wasn't able to try the ringlight in the garden, so had to concentrate on indoor subjects, primarily flowers. However, this restriction on subject matter forced me into looking for creative ways of shooting my subjects to provide enough variety to the images.

I started off by taking a straightforward picture of a small gerbera. With the ringlight attached to the Tamron lens, the lighting from the ringlight proved shadowless as expected, making it ideal for capturing some abstract images of its petals. As well as using different viewpoints and apertures, I also tried changing the colour of the

backgrounds, using nothing more fancy than coloured ring binders! I then used a similar set-up to shoot some images of a rose but from further away.

Way back in autumn, I collected a number of brown and red leaves for future use in still-lives. They've sat in a box under my desk since then, but at long last, I had my opportunity to photograph them. My first attempts of shooting the leaves weren't great, with the dry textures of the leaves not being particularly photogenic. So instead, I took the ringlight off the lens and placed it on the floor facing the camera, then placed a leaf in the space between so that the light shone through it. The backlit effect through the translucent leaf gave far more striking results, especially when using two different coloured leaves in the image. Having done this, I discovered that using the ringlight off-camera really opens up the picture-taking possibilities. Regrettably, I didn't have enough time to try out a few of my ideas, including shooting jewellery with the ringlight directly above or backlighting a sheet of white paper and placing flowers, ferns and thistles in front to create silhouettes. However, in the time I did have to use it, I was left in no doubt that if you're willing to experiment a little, you'll find this budget ringlight to be a brilliant aid to your close-up photography. Thank you Geoff for bringing it to everyone's attention! 🌸



Autumn colour

You don't have to leave the ringlight attached to the lens – in fact, taking it off opens up far more options for creative lighting!

Theme: ND and ND grad filters**Budget:** £15**Challengee:** Lee Frost

DO YOU USE filters on your lenses? If you've been a keen photographer since the days of film then chances are you do, whereas if you've come into the

hobby during the digital era it's quite likely that you don't. Lots of digital shooters these days think that filters are irrelevant because anything they do, you can always do later in Photoshop, but while this is true to an extent, filters still have a place in modern image-making and it's no surprise that pretty much all experienced landscape photographers still use them.

Like reader Michael Walton, many enthusiast photographers steer clear of filters because of the cost. Lee Filters is the most popular 'pro' brand, but a holder, adaptor rings and a set of filters will set you back hundreds of pounds and if you're not really sure whether filters are for you, that's a lot of money to risk. There are less costly brands, such as Cokin, Hitech and Kood, but they're still not 'cheap'. Luckily, we stumbled upon some real bargain-basement deals on Amazon and, intrigued to find out if they were worth even considering as a viable option for serious photographers, bought ourselves a set of XC Source filters (three solid NDs and three ND grads), plus nine lens adaptor rings and a three-slot filter holder for the princely sum of £13.90. On the basis that their cost would hardly break the bank even if the filters turned out to be rubbish, we decided it was a risk worth taking.

Solid Neutral Density (ND) and Neutral Density grads (ND grads) are the two most useful types of filter for landscape photography. ND filters are designed to reduce the amount of light passing through



Above: If you've got a Cokin P Series holder, the XC Source filters are compatible with it. Just attach the holder to your lens and slot in your filters, ideally in the first slot to prevent light from reflecting off the back of the filter.

so that you can use a longer exposure (slower shutter speed). This is handy for recording motion in a scene – adding a milky blur to rivers, waterfalls and waves, recording movement in swaying grass or blowing trees and so on. You can stop your lens right down to its minimum aperture (usually f/22) and set the lowest ISO rating to get the slowest possible shutter speed, but sometimes this still doesn't give you the desired effect. That's when ND filters come in – pop one on your lens and it will increase the exposure without causing any colour shifts – hence the 'neutral' part of the name.

Neutral Density (ND) grad filters have a neutral density top half and a clear bottom half and allow you to tone down bright sky so that it doesn't overexpose when you correctly expose the foreground. If you do overexpose the sky to the extent that some areas 'blow out', you won't be able to rescue it later because if no detail records, there's no detail to recover. Some photographers avoid this by taking two shots of the same

scene – one correctly exposing the sky and the other the landscape – then combining them in Layers and using a Layer Mask and the Eraser Tool to 'rub out' the overexposed sky so the correctly exposed sky shows through. This is a more precise technique, but it's also more time-consuming and in most situations you can use an ND grad on the lens to balance the sky and landscape when you take the shot and achieve the same result.

The filter kit we purchased consists of three solid ND and three ND grad filters with densities of 2x, 4x and 8x. This basically means that they reduce the light by one, two and three stops respectively; the solid NDs doing that across the whole image and the ND grads doing that just on the sky.

The filters all measure 85mm wide by 95mm deep. This makes them the same width as the popular Cokin P Series filters, so they will fit into a Cokin P Series holder or other 85mm-wide filter holders – as well as the filter holder supplied with the kit, which is really just a direct copy of a Cokin holder! The kit also comes with nine adaptor rings that allow you to fit the holder to lenses with

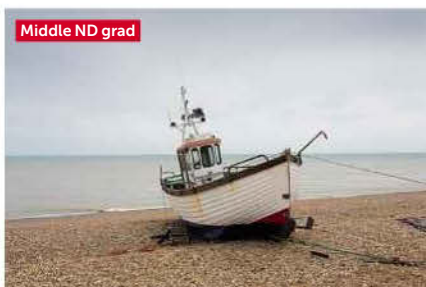
ND GRAD COMPARISON SET: We were pleasantly surprised at the quality of the filters – the images were only marginally less sharp than those shot with the Lee Filters ND grad.



No filter



Weakest ND grad



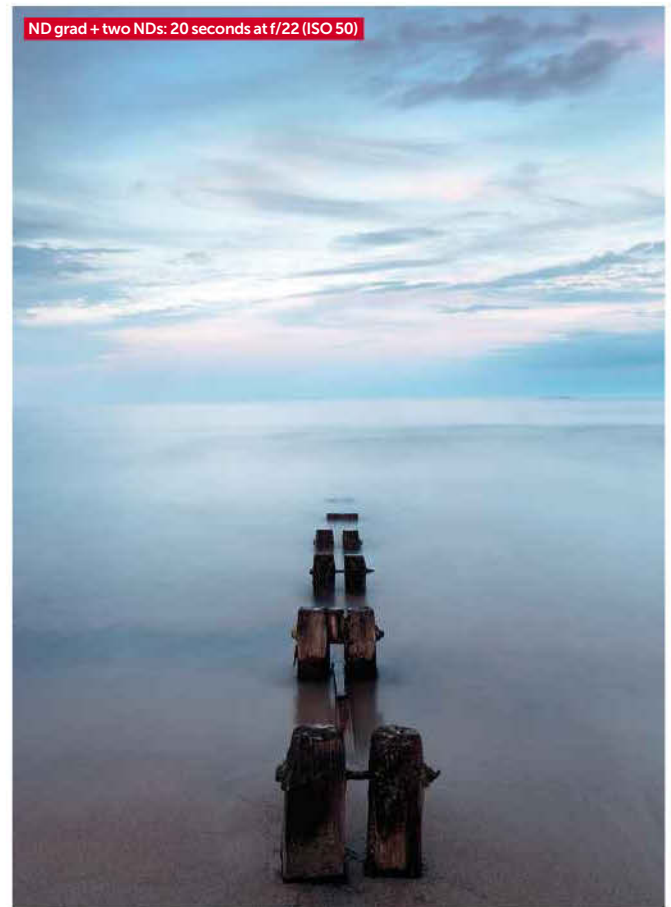
Middle ND grad



Darkest ND grad



Lee Filters 0.45ND hard grad



"Neutrality is important with ND grads – they're supposed to tone down the sky without changing its colour"

a filter diameter from 49mm to 82mm in all standard sizes (see panel). Oh, and there's a soft pouch that carries all six filters in individual pockets so they're kept safe and well protected. Considering all this costs under £14, we were keen to try the filters out and see just what they were capable of.

Using the filters is as straightforward as any other brand – attach the relevant adaptor ring to the lens, slide the holder into place then slot a filter into the holder, ideally using the slot closest to the lens for the first filter to reduce the risk of light reflecting off the back of the filter. When you're shooting in landscape format and using an ND grad, you can use the holder on lenses as wide as 24mm (16mm APS-C) before vignetting starts to become an issue and the sides of the image go dark because the lens can see the filter holder. If you don't have an ND grad in the holder, you're free to rotate the holder so the side rails are above and below the lens rather than on each side and this lets you zoom right back to 16/17mm (11/12mm APS-C) and take shots that are free of vignetting. Turn the camera on its side for

portrait-format shots and you can shoot at 16/17mm (11/12mm APS-C) even with an ND grad in the holder because the side rails of the holder will be parallel with the longer edges of the image, where the field-of-view of the lens isn't so wide. This makes the filter kit highly versatile, as wide lenses tend to be favoured for landscape photography.

Neutrality is important with ND grads – they're supposed to tone down the sky without changing its colour.

Our tests show that they are pretty good in that respect, with just a very faint red cast showing in shots taken on a very flat, grey day. We were actually shocked by the neutrality of the ND grads given their price – some brands costing much more aren't as neutral. The only time this changed was when we combined two ND grads and effectively over-graded the sky for dramatic effect. This resulted in the top part of the sky taking on an unattractive magenta cast, though again you could remove that – and if you intend converting the shot to black & white it's irrelevant anyway.

Image quality is good – damn good! By way of comparison we shot the same scene »

HANDY HINT

If the filter holder causes vignetting you can always make a 'wide-angle' version by cutting off one or two of the slots with a hacksaw – maybe buy a second holder for this purpose as they're so cheap.

XC Source filter set



XC Source Full and Graduated filter set

Price: £13.90 from ukprostore via Amazon (price includes free UK delivery)

Construction: Optical resin (filters), aluminium (adaptor rings), plastic (holder)

ND filters supplied: ND2, ND4, ND8

ND grad filters supplied: ND2, ND4, ND8

Adaptor rings supplied: 49mm, 52mm, 55mm, 58mm, 62mm, 67mm, 72mm, 77mm, 82mm

Filter holder supplied: 3-slot 85mm wide

Carrying case supplied: Carries six filters

Size: 85x95mm (filters), 230x120mm (case)

Website: www.amazon.co.uk

Note: If you already have a Cokin P Series-compatible filter holder and adaptor rings, you could just buy the ND and ND grad filters listed above, plus carrying case, for £8 (free delivery) from ukprostore on Amazon.

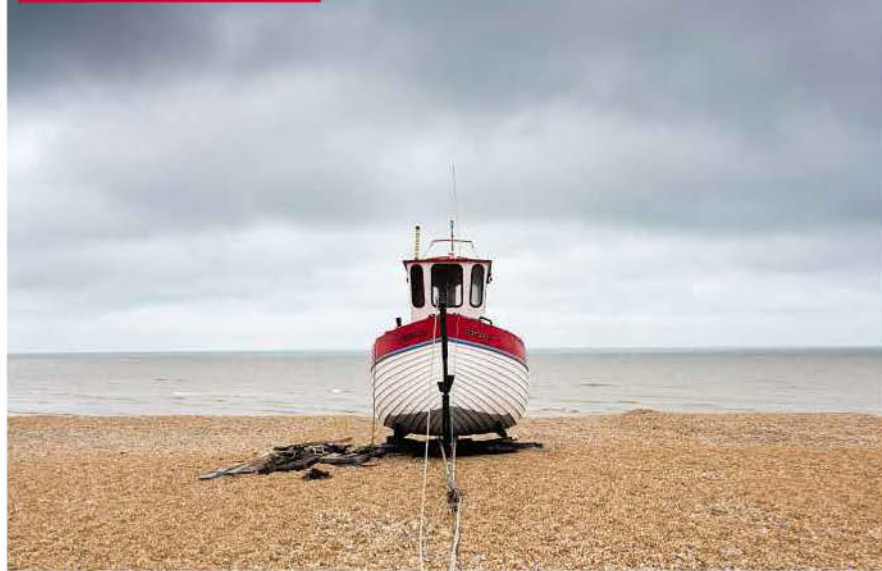
Top tips: Using filters

- 1) Always keep your filters clean – use a microfibre cloth for this purpose so it doesn't damage the filter's delicate surface. Dirty filters degrade image quality and can increase the risk of flare.
- 2) Use as few filters as you can – the more you place on your lens, the more image quality will be reduced, especially with budget-priced filters. Ideally remove any Skylight or UV protective filter from the lens before adding others.
- 3) Place the first filter in the holder slot that's nearest the lens so there's less chance of stray light reflecting off the back of the filter and affecting the images you shoot. If reflections are a problem, cover the top of the filter holder with a cloth or shield it with your hand.
- 4) Beware vignetting with wide-angle lenses – this is caused when the filter holder falls inside the lens's field-of-view, resulting in darkened image corners.
- 5) Align ND grad filters so the ND part of the filter only affects the sky and not the scene. You can do this by sliding the filter into the holder while looking through the camera's viewfinder, or while looking at the preview screen in LiveView mode so you can see when the filter is in position.
- 6) Try to avoid using lens apertures smaller than f/11 with ND grads, so you can't see where the ND area ends in your images.
- 7) You can combine two ND grads to get a stronger effect but be careful not to over-grad the sky as it will look unnatural. You're better off using one ND grad then darkening the sky a little more in post-production if necessary.
- 8) Solid ND and ND grads can be used together. You can also use either or both with a polarising filter.

COMBINING ND FILTERS AND GRADS:

Our test shows how well the filters performed. There's a slight red colour cast when combining two darker NDs, but this can enhance your shots.

Middle ND grad: 1/250sec at f/8 (ISO 200)



“The filters performed remarkably well and would hold their own against brands such as Kood and Cokin, despite costing a fraction of the price”

with no filter and also with a Lee Filters ND grad (costing almost £75) and though the shot through the Lee ND grad is a little sharper when the images are viewed at 100%, it's not that much sharper considering the massive price difference; the budget grads are more than good enough for serious use. The graduation falls between what other manufacturers would term 'hard' edged and 'soft' edged – it's not soft on any of the three grads, so you get a defined effect, but not hard either so you needn't worry about seeing the edge between the ND and clear areas of the filter in your shots.

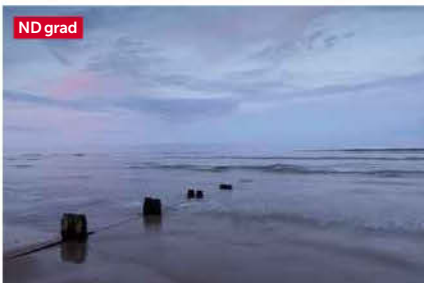
To test the ND filters, we shot a dusk scene and used each ND in turn, then

combined the two densest to give a stronger effect – the equivalent of five stops. An ND grad was also used on all the ND test shots, to balance the sky. Again, the filters performed remarkably well and would hold their own against brands such as Kood and Cokin, despite costing a fraction of the price (you can buy the six filters tested here as a kit for just £8, delivered free of charge, if you don't need the holder and rings).

Neutrality is good again, with only a slight increase in red when the two darker NDs were combined – but when shooting at dawn and dusk that doesn't matter and can actually enhance rather than spoil an image.

The only time neutrality became an issue was when we combined the two darker NDs (to achieve a long exposure) with an ND grad on a dull day – an obvious pink/magenta cast registered on the final image. This isn't unusual – other more expensive filter brands produce similar results when several filters are combined – and certainly not a reason to discount the XC Source filter kit. The colour cast was easy enough to remove in Photoshop by adjusting Colour Balance, and only became an issue when

ND grad



ND grad + weakest ND



ND grad + medium ND



ND grad + darkest ND



ND grad + two darkest NDs





Above: We were pleasantly surprised at the filters' quality. There was a strong magenta cast when we 'over-graded', but converting to black & white creates a fantastic dramatic effect.

we used three filters together – which you're not likely to do on a regular basis. If you do, though, don't worry about image quality – it remains very good indeed.

The only other issues were flare and reflections when shooting at ultra-wide focal lengths – 17-20mm on a full-frame DSLR – and using two or three filters together. This was probably caused by light reflecting off the back of the filter/s. It was never bad enough to ruin a shot, and it only occurred at really wide focal lengths, but it did mean more work at the computer later to get rid of the light patches. Covering the

lens and the top of the filter holder with a cloth prevented it – something we discovered through trial and error.

Having shot dozens of images in different locations and weather conditions, we're surprised and impressed by the quality of the filters supplied in this kit. Okay, they're not in the same league as Lee Filters, but then a single Lee ND grad will set you back almost £75, which is five times the cost of this entire kit of six filters, nine adaptor rings and a holder! Considering what you get for the money, the XC Source kit represents amazing value and we'd have no hesitation in recommending it to any photographer who's working to a tight budget or just wants to try out ND and ND grad filters for the first time without breaking the bank. 🍀

Other budget options



■ Cokin H270A Full ND Filter kit

Price: £40

Visit: www.amazon.co.uk

Cokin revolutionised slot-in filter systems and our budget kit from XC Source is basically a cheap rip-off of the popular Cokin P Series. This Cokin kit consists of a 34-slot P Series filter holder and three solid ND filters (x2, x4 and x8). You'll need to buy an adaptor ring as it isn't supplied.



■ Cokin H250A Full ND Filter kit

Price: £39.85 (free delivery)

Visit: www.amazon.co.uk

The same idea as above but with three ND grad filters in x2, x4 and x8 densities. If you buy both Cokin kits you'll have the same filters as you get in the XC Source kit, plus two holders, but it'll cost you £70 and you'll need adaptor rings plus a case – though the filters are better quality.



■ Hitech 85mm

Price: £105

Visit: www.teamworkphoto.com

Hitech filters are great quality. You could buy a set of three solid ND filters (£43.20) and a set of three ND grads (£52.80) and use them in a budget Cokin P Series-compatible holder – a three-slot holder with nine adaptor rings from ukprostore on Amazon costs £8.34 with free delivery.

Theme: Wireless flash system**Budget:** £75**Challengee:** Daniel Lezano

FLASH PHOTOGRAPHY IS without doubt something many struggle with and fail to master. While the incredible sophistication of today's camera-to-flash communication means that taking well-exposed flash images is easier than ever, there are still major areas of flash that flummox all but the most experienced of photographers. Therefore, a large number of beginners and enthusiasts steer clear of spending the considerable outlay on flashguns and associated accessories that is generally required to shoot all but the most simple of flash-exposed images.

This is particularly true with using off-camera flash. The first obstacle to overcome is deciding which method you use to trigger the flash. There are traditionally three main ways to do this. The first is to connect the flash to the camera using a dedicated flash sync cable, which can be used in both a manual flash set-up or with TTL flash metering (if your flashgun offers it). This method has its

“Wireless triggers do away with the key limitation of leads, namely how far you can place the flashguns away from the camera”

drawbacks, however; the physical limitation of the cable being the main one. The second method of firing the flash is optical triggering – this involves putting the flashgun into Slave mode and triggering it using an on-camera flash or dedicated commander unit. Although free from trailing wires and offering an increased range over sync cables, optical triggering still has its limitations – it requires line-of-sight for one and, secondly, it can be inconsistent when shooting in bright light.

The final method of triggering is using dedicated radio triggers. These do away with the key limitation of leads, namely how far you can place the flashguns away from the camera (most boast a range of 100m or more), and don't require a line-of-sight. They often come in sets of two, featuring a transmitter that attaches to the camera via the hotshoe and a receiver unit on which sits the flashgun. However, increasingly you'll find the pair of triggers are both transceivers, allowing them to act as the transmitter or receiver. Regardless of the type you buy, optional triggers are available should you wish to control several flashguns off-camera, with most allowing literally dozens of triggers to be used »



Anatomy: Yongnuo trigger

- 1) Indicator lights:** Single green lamp means power, double green indicates the triggers are communicating with each other, red indicates the shutter activated.
 - 2) Shutter release button:** Lets you use trigger as a wireless shutter release.
 - 3) Hotshoe for your flashgun:** Used to fire the flashgun, whether on a camera-mounted trigger or off-camera.
 - 4) PC socket:** For a wired connection between trigger and studioflash.
 - 5) Power switch:** Switch trigger on or off.
 - 6) Battery compartment:** 2x AAA batteries.
 - 7) Channel selector:** Used to set all the triggers to the same channel to ensure they communicate with each other.
 - 8) Base hotshoe:** Slip on the camera's hotshoe if using trigger as a transmitter. If trigger is the receiver, place on a stand.
- Not shown Remote cord:** Connect lead to remote socket of camera for use as remote shutter trigger. Cord not required for off-camera flash synchronisation.



Above: One flashgun is placed behind the subject's hood, the other in front at 45°. Each flash is fired by a trigger on a Canon EOS 550D. Inset right: Taken using ambient light only, the result lacks the impact of using the flashguns.

Yongnuo trigger stats

Yongnuo Digital RF-603C Wireless Flash Trigger



Guide price (set of two): £50

What we paid (set of two): £24

Camera compatibility: Two sets are available, the only difference being the supplied remote shutter release cable
Choose from the following:

● RF-603C with C1 cable:

Features a mini-plug jack compatible with:
EOS: 60D; 450D; 500D; 550D; 600D;
650D; 700D; 1000D; 1100D
Pentax: K20D; K10D; K100D; K-7

Samsung: GX-20; GX-10

● RF-603C with C3 cable:

Features a multi-plug jack compatible with:
EOS: 1D/Ds-series; 5D-series; 7D; 10D;
20D; 30D; 40D; 50D

Note: Both RF-603C sets can be used with other brands of camera as per instructions in article. Please note Nikon users should opt for the RF-603N version, although you can use the RF-603C if required. Almost all brands of flashgun can be used

Range: Approximately 100m

Channels: Four

Supplied accessories: 2x AAA batteries and instruction manual

Size: 155x40x18mm

£24

HANDY HINT

You can use Yongnuo triggers designed for Nikon cameras on Canon models. Simply place on the hotshoe, then slide back until the green light on the trigger appears. You're now ready to go!

**Original****Create mood with flash**

In manual set the flash sync speed and a small aperture to underexpose the scene. Set both flashguns at high power to illuminate the subject. The result is a high-contrast image with far more impact than captured using only ambient light.

PREPARING A SIMPLE OFF-CAMERA FLASH SET-UP WITH THE YONGNUO KIT

- 1) Place one trigger on the camera's hotshoe – this will automatically act as the transmitter.
- 2) Place the flashgun onto the other trigger's hotshoe. Slip this on the supplied stand – this will automatically act as the receiver. Place this on a stable surface, tripod or lighting stand.
- 3) Switch on the camera, flashgun and both triggers. Set the camera to manual and fire the shutter release to test the set-up. If it doesn't work, check the contacts – you should see two green lights appear on both triggers.
- 4) Adjust the flash's manual power settings and take test shots until you're happy with the output power and direction. Now you're ready!



Popular budget flashguns

So how does the Yongnuo Digital Speedlite YN560-II flashgun compare to other budget flashguns? Here we cover the main features of popular flashgun models on sale under £100. We'd not recommend those without manual power settings for off-camera flash usage.

■ Metz Meeablitz 20 C-2

Guide price: £40

Street price: £40

www.intro2020.co.uk



Compact unit with a Guide Number of 20 (ISO 100, m). No bounce head but has a tilting reflector (+90°). Lacks TTL but has two Auto modes and a manual flash mode.

■ Metz Meeablitz 36 C-2

Guide price: £80

Street price: £70

www.intro2020.co.uk



Similar to the Auto/Manual Metz 20 C-2 but is more powerful, with a Guide Number of 36 (ISO 100, m). A manual zoom facility allows coverage to be set from 28-85mm.

■ Nissin Di466

Guide price: £150

Street price: £80

www.kenro.co.uk



Boasts TTL metering and Guide Number of 33 (ISO 100, m). Manual power settings available in six steps (full to 1/32). Available for Canon and Nikon DSLRs, as well as Olympus/Panasonic CSCs.

■ Sunpak PF30X

Guide price: £95

Street price: £70

www.intro2020.co.uk



Compact considering it has a Guide Number of 30 (ISO 100, m). Offers TTL control for Canon or Nikon and, while it offers an EV adjustment function, lacks manual control.

■ Metz Meeablitz 36 AF-5

Guide price: £105

Street price: £65

www.intro2020.co.uk



A great budget choice if you want dedicated TTL flash. Boasts a Guide Number of 36 (ISO 100, m) and zoom flash from 18-85mm, but no manual control.

together. The stumbling block, again, is the cost of buying the triggers and flashguns.

So what if I told you that parting with the relatively modest sum of £75 was all that was needed to not only provide you with an opportunity to learn the basics of manual flash photography, but also give you the basis to experiment with off-camera flash set-ups? This budget buy is our favourite yet, bringing you not one but two absolutely bargain-priced accessories that can open up new areas of photography for you to experiment with. We'll be showing you how our £20 wireless trigger set, used with one or more of our £40 manual flashguns, is all you need to enjoy shooting creative flash photography.

So let's start by looking at the flashgun. At first glance, the Yongnuo Digital Speedlite YN560-II looks much like the models you'll find from the likes of Canon or Nikon. It feels similarly well made, too, with a robust casing, a smooth tilt/swivel head, a large LCD panel on the rear, surrounded by a cleanly labelled, neat arrangement of buttons. It's supplied in a

"For anyone who has forked out £200+ on a Canon Speedlite or Nikon Speedlight, this will come as nothing short of a shock"

high-quality case and includes a foot on which you can stand it on. In fact, apart from the unfamiliar brand name, you'd think it was a top-end flashgun. Except it costs less than £50. For anyone who has forked out £200+ on a Canon Speedlite or Nikon Speedlight, this will come as nothing short of a shock. But there is one major difference between the Yongnuo and the better-known flashguns – it is a fully manual flashgun, completely lacking any form of TTL flash metering. That means that, unlike the flashguns from established brands, you can't just stick it on the hotshoe, switch it on and start blasting away, safe in the knowledge you'll most

Optional accessories for off-camera flash



■ LIGHTING STAND

The flashgun's supplied stand features a standard tripod bush so you can fit to a tripod or most lighting stands to allow positioning at varying heights.



■ LIGHT MODIFIERS

Vary the flash output by fitting a modifier on the flash head. A diffuser, reflector or softbox all allow you to direct the output's direction, spread and power.



■ FLASH GELS

By placing coloured flash gels over the heads of off-camera flashguns, you can add visual interest to backgrounds that would otherwise look bland.

likely get perfect exposures every time. Instead, you must take control of the flash output yourself and set the power manually. Now, this may sound incredibly difficult, but it really isn't. Before starting with the flash, first set up the camera. With it set to manual exposure mode (M), set the shutter speed to the flash sync speed (if you're unsure, use 1/90sec or 1/125sec) and choose an aperture. We'd suggest starting with f/5.6. You can change it later, just remember that once you've set up the flash power correctly, any change in aperture will also mean the flash's power setting will need changing, too.

With the camera set up, it's time to set the power on your flashgun. You'll note the flash has a number of output settings that range from 1/1 (full-power) to 1/128th power. With the flash set to its manual mode, all you have to do is use the left and right button of the four-way control to change the power setting in full-stop increments. By pressing the up and down button, you can fine-tune power in 1/3-stop increments. You can then take a picture, review the image (and histogram) on the camera's LCD monitor and adjust the power again until the exposure is correct. You should also note that you can use the flashgun's zoom head to boost or

reduce the amount of flash by pressing the + button to zoom it towards the tele-end of the zoom head's range (more power, but a narrower coverage), or press the - button to zoom out for a wider coverage but with less range. Now admit it – that's far easier than you expected it to be, isn't it?

So those are the basics of how to use your flashgun in manual while it's sat on the camera's hotshoe. How you'd use it off-camera isn't much more difficult. All

you need is something to fire the flashgun when the shutter release is pressed; in other words, a trigger. Step forward the second part of our budget bundle: the Yongnuo Digital RF-603C Wireless Flash Trigger. A pack of two costs you £20, which is all you need to fire one flashgun

off-camera. One sits on the hotshoe, the other sits beneath the flashgun. Every RF-603C trigger

is a transceiver, allowing it to act as a transmitter or a receiver. When you switch them on, they communicate automatically so you've no need to set them up yourself. Every trigger features a hotshoe mount on which you can place a flashgun. Therefore, to set up a basic off-camera flash system, all you need to do is place one trigger on the hotshoe and slide the flashgun on the other trigger. The off-camera trigger can then be »

DID YOU KNOW?

Some of the more sophisticated flashguns offer a master/slave function, that allows the primary 'master' flashgun to trigger the secondary 'slave' units. It's a very useful facility if you own several flashguns of the same brand. Our Yongnuo flashgun has this facility, too!

Yongnuo flashgun stats

Yongnuo Digital Speedlite YN560-II

Guide price: £100

What we paid: £48

Camera compatibility:

Conventional hotshoe

TTL flash: No

Guide Number (ISO 100, m): 58

Power zoom: 24-105mm

Bounce & tilt head: Yes. Vertical rotation of -7 to 90°; horizontal rotation of 0 to 270°

Power zoom: 24-105mm

Manual Power: Eight output levels:

Full, 1/2, 1/4, 1/8, 1/16, 1/32, 1/64, 1/128.

Each has 1/3-stop steps

Multi-flash: Up to 100 flashes per burst; up to 100 flashes per second

Audible beep: Yes (can be muted)

Wireless Slave mode: Yes (S1 & S2)

Range: 15m outdoors, 25m indoors

Colour temperature: 5600K

Pilot/Test button: Yes

Rear LCD panel: Yes

PC sync socket: Yes

External power socket: Yes

Recycling time: Approx three seconds (full-power)

Power saving mode: Yes

Wide-angle diffuser: Built-in

Reflector: Built-in

Overheating protection: Yes

Power source: Four AA batteries

Dimensions: 60x190x78mm

Weight: 350 grams

Supplied accessories: Stand, case & instruction manual

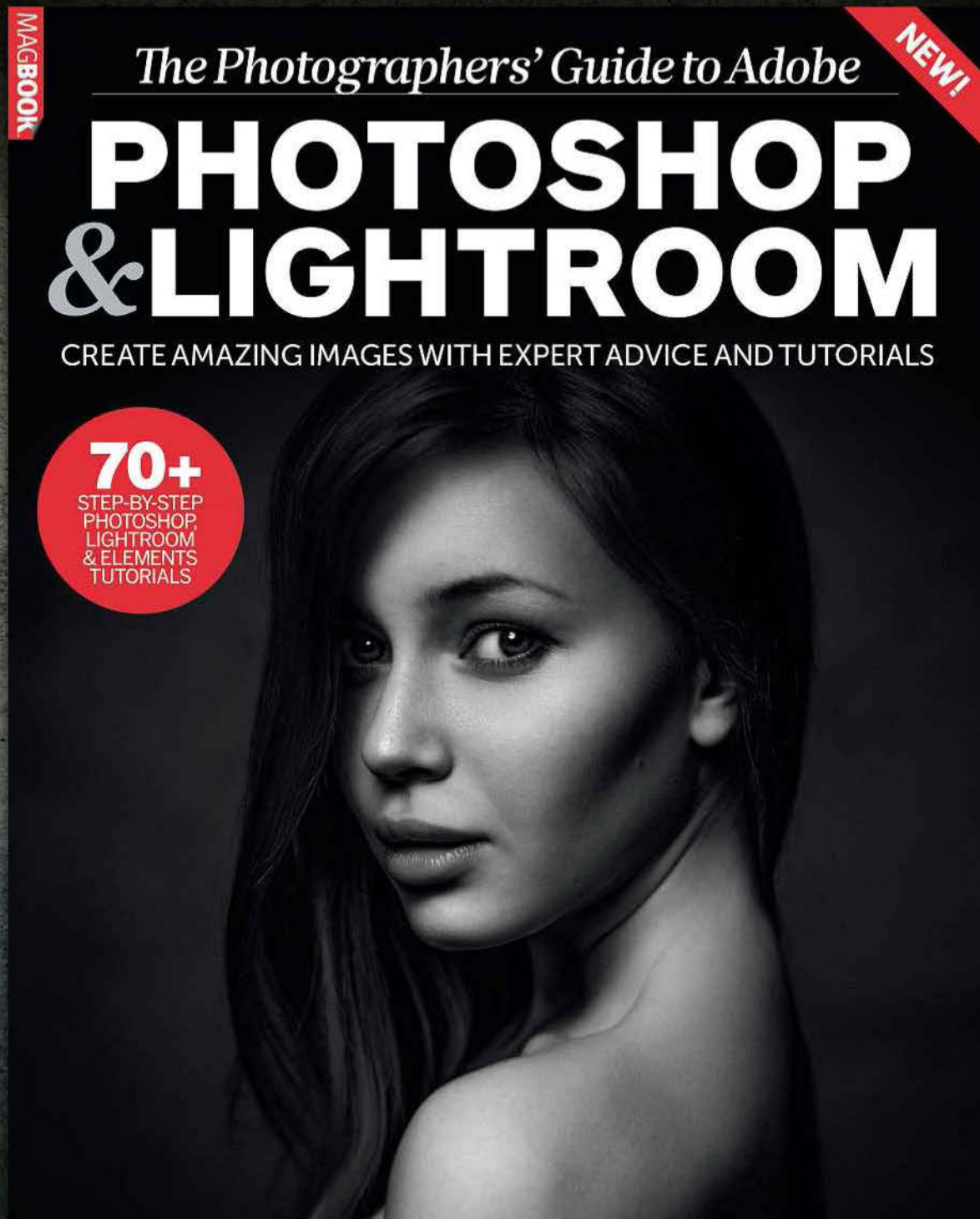


Anatomy: Yongnuo YN-560-II flashgun

- 1) Flash head:** Features a bounce and swivel action, retractable reflector board and wide-angle diffuser.
- 2) Optical control sensor:** Used to trigger other flashguns in multiple set-ups.
- 3) PC socket:** Connects trigger to studioflash.
- 4) Hotshoe stand:** Place on stable surface or mount via tripod bush to a support.
- 5) LCD panel:** Illuminated whenever a button pressed to aid usage in low light.
- 6) Battery compartment:** 4x AA batteries.
- 7) Audible beep:** Set on or off.
- 8) Mode button:** Select Manual, S1 or S2 slave modes or the Multi-flash setting.
- 9) Zoom button:** Extend the zoom head manually to match the focal length of the lens.
- 10) Pilot/test button:** Green indicates charging, red means fully charged. Can be pressed to test the flash.
- 11) Four-way control:** Use to change flash settings.
- 12) Power switch:** Hold to power on flash or switch it off.



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Studio on the go!

We used one off-camera Yongnuo flashgun at 45° to the subject and another aimed at the wall in the background, both wirelessly triggered.

"As well as being a wireless flash trigger, this £20 pairing can be used as a wireless remote trigger, too!"

slipped onto the flashgun's stand, allowing the flashgun to sit upright on a surface. The stand features a standard tripod bush, so if you want, you can use a lighting stand or tripod as a way of raising the flashgun to your desired height.

With both triggers switched on, you should see a pair of green lights that indicate the set-up is ready. Press the camera's shutter release and the hotshoe-mounted trigger should wirelessly communicate with the other trigger to fire the off-camera flash. It's worth noting that you can place a flashgun on the hotshoe-mounted trigger and use this, too, as the triggers offer pass-through functionality.

Any number of RF-603C triggers can be linked together, so, in theory, you could buy four triggers and four flashguns and have a hotshoe-mounted trigger/flashgun and three off-camera trigger/flashguns. At the time of writing, this four-flash set-up would cost around £240, less than the cost of one branded flashgun!

The Yongnuo trigger has another trick up its sleeve, too. It's supplied with a cable that connects into the remote release socket of the camera. Connect this to the hotshoe-mounted trigger and you can handhold the

other trigger and use the big black button at the front to remotely fire the shutter release. Yes, as well as being a wireless flash trigger, this £20 pairing can be used as a wireless remote trigger, too!

But that's not all – the Yongnuo flashgun also has a couple of tricks up its sleeve. Press the Mode button beyond M (manual) and you'll find S1, S2 and Multi. The latter fires multiple bursts of flash for special effects, which few of us will try, while the S1 and S2 settings are far more interesting. These are slave settings that allow you to use multiple off-camera flashguns without triggers. So, invest in several Yongnuo flashguns and you can place a 'master' flashgun on the hotshoe and several others on the supplied stands, then use the S1 or S2 settings to link all the off-camera flashes to fire automatically along with the master flash. Very impressive!

Start off with a pair of triggers and one flashgun and use this set-up to learn the basics of off-camera manual flash photography. Should you then fancy more elaborate set-ups, invest in more triggers and flashguns. We used three triggers and two flashguns for the images in this article and may get more – we're that impressed and we think you will be, too! 📸

Popular flash triggers

In this panel you can compare Yongnuo flash triggers with more established models. More expensive models such as the Pocket Wizard range are available, but we've limited our selection to sub-£150 models. Please note prices are for a kit (ie one transmitter and one receiver).

■ Hahnel Combi TF Remote & Flash Trigger

Guide price: £65

Street price: £50

www.hahnel.ie



Popular budget model that doubles as a remote release as well as a non-TTL wireless flash/studioflash trigger. Range of 100m. Available for all major brands.

■ Interfit Strobies i Sync 4 Wireless and Optical Trigger/Receiver Set

Guide price: £60

Street price: £50

www.interfitphotographic.com



Designed for use with flash and studioflash, the Interfit offers four channels. As well as a radio trigger with a range of 30m, it also offers optical triggering with a longer coverage.

■ Calumet Pro Series 4 Channel Wireless Trigger Kit

Guide price: £55

Street price: £55

www.calumetphoto.co.uk



Four-channel radio trigger with a 100m range. Available in Nikon & Canon fittings, the latter also being suitable for Olympus & Sony via an optional cable. Not TTL.

■ Hahnel Tuff TTL Wireless Flash Trigger

Guide price: £110

Street price: £90

www.hahnel.ie



This model boasts robust build to survive rough treatment. Offers a range of 200m, TTL flash as well as high-speed sync and second-curtain sync.

■ Phottix Strato II 5-in-1 Wireless Trigger Kit

Guide price: £100

Street price: £100

www.intro2020.com



Suitable for use with flash or studioflash and has a range of 150m. As well as four channels, also has four groups for use by multiple photographers. TTL flash, too.

■ Pixel Knight TR-332 LCD E-TTL Wireless Trigger Kit

Guide price: £120

Street price: £120

www.theflashcentre.com



Very sophisticated Canon-compatible trigger with TTL flash capability as well as flash sync up to 1/8000sec. Can be used in manual (non-TTL) with other brands.

Theme: B&W conversion software**Budget:** £20**Challengee:** Lee Frost

THERE ARE MORE ways to convert a colour digital image to black & white than there are to skin a cat, from Photoshop, Lightroom and Aperture to free plug-ins and expensive standalone applications like Nik's Silver Efex Pro. All are intended to do the same job, but the way they do it differs enormously, as does the level of input/experience required from you.

The most common problem we see is that converted images often appear rather grey and lacklustre; they lack impact, as if the creator was scared to be bold. This doesn't just apply to beginners either – many photographers with years of experience and who produce awesome colour images just can't get to grips with black & white. Maybe it's because mono is a step away from reality and most of us struggle with that – it gives us too much artistic freedom and we don't know what to do with it.

Whatever the reason, boring black & white is far too widespread for our liking, so we're always keen to explore ways of making monochrome more exciting. Nik Software's Silver Efex Pro is perhaps the best solution and is favoured by many mono fans. However, despite a price drop, you're still looking at the sharp end of £100 to buy it as it's now only available as part of the entire Nik Collection (which is fantastic, but only if you're going to use the other applications like Colour Efex Pro and HDR Efex Pro).

Fortunately, we recently discovered an alternative that works in a similar way to Silver Efex Pro but costs a fraction of the price. It's called Perfect B&W by onOne Software (www.ononesoftware.com). The Premium Edition costs \$99, but the Standard Edition is an absolute bargain at

**Original****Default setting**

Filter Presets: These presets allow you to change tonal balance by lightening certain tones and darkening others. The red preset gives the most dramatic effect, turning blue sky almost black and increasing contrast.



just \$29 (less than £20) and though it lacks some of the features of the Premium Edition, it has everything you'll ever need to create stunning black & white images. It also operates as a standalone application, rather than as a plugin, so you don't need Photoshop to use it.

Once the software has been installed and the application launched, the Perfect B&W window opens on your desktop. Clicking on Browser allows you to trawl through your images to find the one you want to convert,

**Red filter****Budget B&W software****onOne Software Perfect B&W****Price:** \$29 (Standard), \$99 (Premium)**Availability:**
As download**Platforms:** Mac OS X 10.6, 10.7, 10.8; Windows Vista, 7, 8; Intel Core Duo, Xeon or better processor, 4Gb RAM minimum, 1.5Gb hard drive space for installation**Applications supported:** (for Premium Edition) Photoshop CS4, 5, 6; Elements 9, 10, 11; Lightroom 2, 3, 4, 5; Aperture 2.1, 3**Website:** www.ononesoftware.com

If you're not sure whether Perfect B&W is for you, check out the online tutorial video and download a free trial so you can try before you buy – though we're sure that by the time the trial runs out you'll be more than happy to part with \$29.

**HDR Landscape preset**

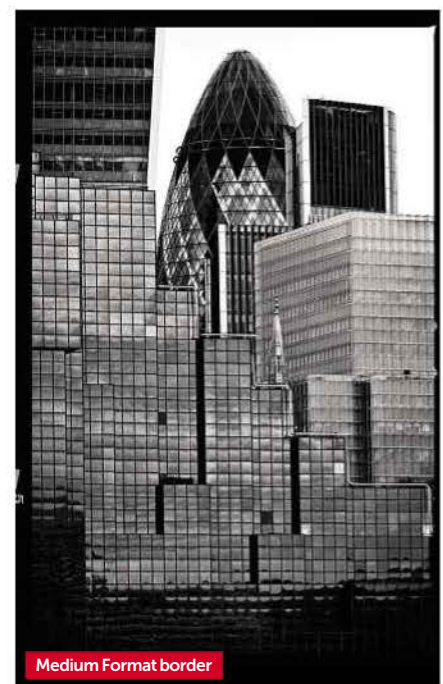


Software interface: The main interface of Perfect B&W is easy to navigate – presets are shown on the left side, applied to thumbnails of the main preview image, while the adjustment and creative tools are shown on the right and the brushes on the top-left corner of the preview image.

Border Presets: Adding a border to your image is a doddle – just turn the Border tool on by clicking the On/Off tab, choose a category, then select a specific border from the drop-down menu.

though it's quicker if you make a selection of images and place them in one folder so that once the folder has been selected, you can scroll through the images in it while in Perfect B&W and convert one after the other. Double-clicking an image on the Browser pane opens it in the main preview pane, then if you click on B&W at the top-right corner of the window, that image is converted to B&W using the default settings.

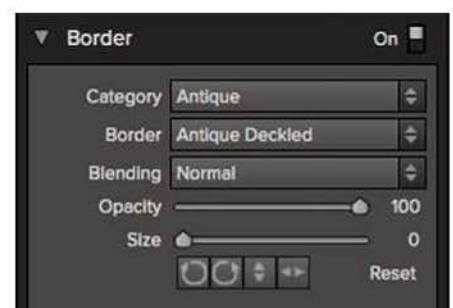
Down the left side of the window you'll find the presets – loads of them, in categories such as Basic Fundamentals, 19th Century Processes, 20th Century Classic Silver, 21st Century Modern Digital and so on. Clicking the tab next to one category reveals all the presets in that category, or you can click the All tab and it reveals every preset. The image you've selected is shown as thumbnails down the left side of the screen with the presets applied and double-clicking a preset will add it to the main preview image. It's worth trying all of this to see which you prefer as they offer a quick and effective solution in many cases. Recently used presets are remembered, plus you can flag your favourites so they're quicker to find and use. When new presets are created you can also download them for



free and add them to your collection.

Whether you choose a preset or not, on the right side of the window you'll find a range of controls and effects. Tone, Colour Response and Tone Curve are the most useful as they allow you to adjust the contrast, exposure and tonality of the image. If you're aiming for a fairly straight conversion but you just want to tweak the image, you'll probably find that you can use these controls alone and not bother with a preset.

Next comes Glow, Film Grain, Toner, »





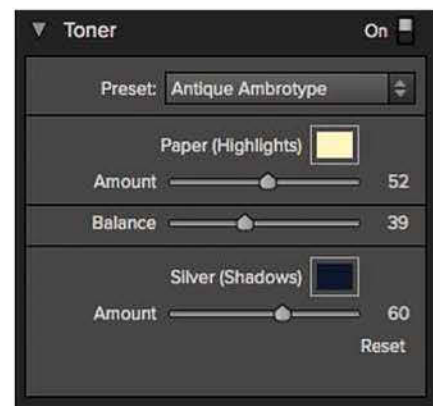
Converting to B&W

- 1) There's much more to black & white conversion than simply removing colour from the original image – it offers endless scope for creative expression and personal interpretation.
- 2) Black & white photography takes you a step away from reality, so make the most of that and let your imagination run wild.
- 3) Study the work of great black & white photographers and ask yourself what it is about their images that you like – then try to replicate that feel in your own work.
- 4) We have it drilled into us that blocked shadows and blown highlights are bad, but in black & white you need true blacks and whites to gain contrast and impact.
- 5) Be bold – try something different and daring. You can always delete any changes you make if they don't work.
- 6) The presets offered by Perfect B&W are a quick fix and can produce great results. Try them all, to see what they do, and note your favourites. That said, don't use presets for the sake of it – they won't turn a sow's ear into a silk purse so you still need a decent shot in the first place.
- 7) Use the black & white filter options to change the tonal relationship in a shot. Some colours come out as similar grey tones – such as red and green – but filters let you darken and lighten those tones so they look different in black & white.
- 8) A creative border can add an extra element to an image. Check out the options in Perfect B&W then maybe stick with one to give your images consistency.
- 9) Don't just rely on the presets – play around with the other controls such as the Brushes, Tone Curve and blending modes to fine-tune the end result.

Toner: There are dozens of presets available in Perfect B&W and more are available to download free from time to time. They offer a one-click conversion and in many cases you won't need to do anything else once a preset has been selected.

Vignette and Border. They're all self-explanatory really. Glow is a bit like Diffuse Glow in Photoshop. Film Grain allows you to add the characteristics of a specific film to the image. Vignette lets you lighten or darken the corners and edges of the image either way, its size, feathering, roundness and style. Border allows you to add one of many different borders to your image to finish it off, with categories such as Antique, Camera, Emulsion, Film, Simple and Sloppy, with a range of borders within each category. Again, some are verging on the ridiculous, but others look great. There's also a Texture category that allows you to choose a texture such as Old Parchment or Scratched Film, then vary the opacity and blending mode to control the strength of that texture on the image. This works really well and is worth experimenting with.

The last two controls on this side are Sharpening and Blending. The former gives you three options – Progressive, High Pass and Unsharp Mask plus various other sliders to control the level of sharpening applied, including an Ethnicity option that lets you choose from various ethnic groups to set sharpening according to your subject's skin



tone! Finally, blending offers the usual range of blending options that you'd expect so that you can vary the effect the black & white conversion has on the original colour image and change the opacity of the layer – the

black & white conversion is automatically made to a duplicate layer, which you can flatten when you're done if you so choose, or alternatively retain.

Considering the price of Perfect B&W, this is a lot of bang for your buck. But we're not done yet. There's more! By the top-left corner of the main preview image you'll see another set of tools.

These are the Brightness Brush, Contrast Brush, Detail Brush, Targeted Brightness, Selective Colour Brush, plus the Hand Tool to navigate the image and the Zoom Tool to enlarge it. The brushes can

HANDY HINT

Always make a copy of the original colour image for conversion to black & white so if you mess it up you'll have the master file to fall back on. You can also make several copies of the same image then convert each one in a different way – this is a great way to develop skill and build confidence.



be varied in size, feathering and strength and allow you to selectively adjust brightness and contrast or strengthen/subdue detail in specific areas. They're just like dodge/burn tools really – by zooming into the image you can work on small areas with precision to get exactly the look and feel that you want. There's also a Perfect Brush option that adds edge-detection to the brush so that it will recognise the edges of the area you're working on and not go over them – this is really handy if you want to darken the sky, for example, and need to work around a building on the skyline.

It's all fairly intuitive, so even if you've never used software like this before you'll soon find your way around it. You can also hit Reset with most of the controls, so if you add a border that you don't like you can get

rid of it. As the changes are saved as a Layer you can also scrap what you've done and start again as the original colour image will be unaffected. That said, you'll probably find that in most cases, one of the presets will give you the result you're looking for, so you won't use many of the other controls, such as the brushes. They're intended for more precise adjustments, which will come as your experience grows.

That's the great thing about Perfect B&W – whether you're a complete black & white novice or a monochrome master, you'll find that it suits your needs and gives you what you want. With a price tag of just \$29, that's pretty awesome in our book, and if you fancy getting into black & white photography, you'll definitely be impressed by Perfect B&W. 🍌

Other budget options

Perfect B&W offers a brilliant solution to b&w conversion at a bargain price. But it's not unique and as well as the premium edition, there are other options available. There are also loads of mobile apps that are cheap or cost nothing at all. Apps aren't as versatile as computer software but they can produce amazing results – and you can import high-res images into your device to convert them using apps such as Snapseed.

■ Topaz B&W Effects

Price: \$59.99

Visit: www.topazlabs.com

A versatile application that will allow you to do everything you could ever want to do to a black & white image – and much more! Choose from over 200 one-click presets, use the Zone System to control contrast, make localised adjustments to contrast and exposure, enhance detail, apply smoothing, add grain and more. Free 30-day trial available.



■ Power Retouche

Price: €19

Visit: www.powerretouche.com

Power Retouche is even cheaper than Perfect B&W. It's not quite as 'polished' or as easy to use, but all the controls you're likely to need are there to let you control contrast and exposure, add the characteristic of different black & white films, filters and multigrade filters (to change contrast) and more. Windows and Mac compatible with a free trial.



■ BW Workflow Pro

Price: \$12.90

Visit: www.fredmiranda.com

Fred Miranda was one of the first to create Photoshop actions and plug-ins. BW Workflow Pro offers tons of options and features including over 70 presets covering toning, dynamic range, film grain and filters. Compatible with Photoshop on both Mac and PC. It even does a damn good pseudo infrared effect – all for less than a tenner!



■ Snapseed

Price: FREE

Visit: www.snapseed.com

Made by Nik Software (which is owned by Google), this is one of many apps available for smartphones and tablets that allow you to create brilliant black & white images. You can convert images shot with your phone/tablet or import images into the device then convert them. There used to be a desktop version, too, but sadly this has been discontinued.





Metered to perfection!
Scenes with strong backlighting can lead to exposure error. Use a grey card and you should have no problems.

BE SURE TO BRACKET!

Whether you use the grey card or not, in tricky lighting conditions, bracket your exposure by +/-1 stops using your camera's exposure compensation or AEB functions to ensure a correct exposure.

How to use your metering & White Balance cards

The 18% grey card can be used to ensure perfect exposures when you're shooting in tricky lighting conditions. Both reference cards can also be used to set a custom White Balance, but how you do this depends on your camera (refer to your camera's manual). In the meantime, here is a brief explanation to get you started

DIGITAL CAMERAS USE sophisticated exposure systems with a choice of metering patterns to suit different lighting situations. The systems work on the assumption that the area of the scene being metered is a mid-tone, or 18% grey to be precise; the average if all dark, light and mid-tones were mixed together. It's the basis of all metering patterns and works surprisingly well, but can render incorrect exposures when the overall scene or subject is considerably lighter or darker than 18% grey. For example, very dark areas can fool the metering system into overexposing the image, while very light areas can fool the camera into underexposure, as the light meter will take a reading that renders it as a mid-tone.

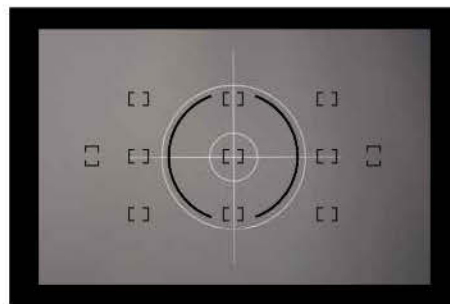
As a camera is trying to render an image 'grey', it's your job to ensure you compensate to keep the tones true to life. You can do this by either using one of your camera's exposure override facilities, such as exposure compensation, the AE-Lock button or by metering from an area of the

scene that has a mid-tone. And that's where our grey card comes in. Using it is very simple as our step-by-step guide below illustrates.

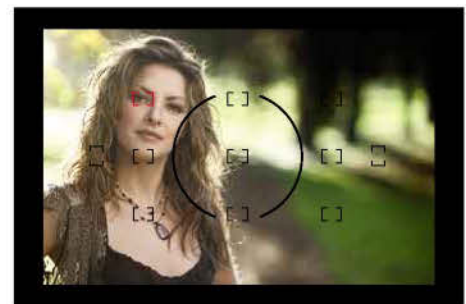
The key thing to remember is that you need to place the grey card in similar lighting to your subject, for instance, don't place it in a shaded area if your subject is bathed in sunlight. Also, make sure that the card fills the metering area – we would recommend you use spot or partial metering as the card won't need to fill the entire image area – but any is suitable. You can either lock the exposure using your camera's AE-Lock facility or note the aperture and shutter speed, then switch to manual mode and dial in these settings. This latter method isn't suitable on days where lighting is variable. The card has AF reference lines to help your camera's autofocus lock on to it. However, you don't necessarily need it to be in focus to work correctly. The grey card (as well as the white card) can also be used to take a custom White Balance reading from, too.



1 Getting started If you're shooting portraits in difficult lighting conditions, such as backlighting, give your subject the grey card and ask them to hold it angled towards you.



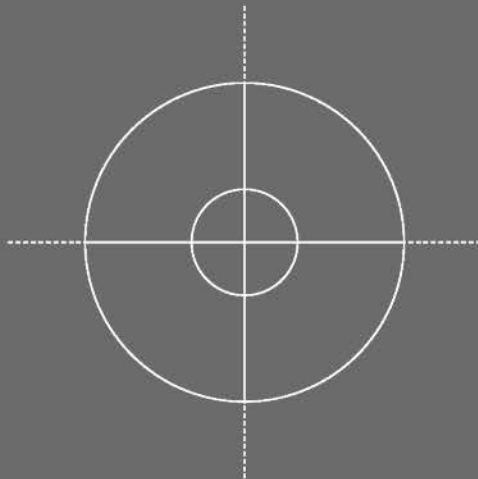
2 Take a meter reading Ensure that the entire metering area is filled by the grey card (in this instance we're using spot metering) and lock the exposure with the AE-Lock button.



3 Compose & shoot With this exposure locked, you can compose your scene and take your shots. When you check it on your LCD monitor, the exposure should be perfect.

GREY CARD

**Digital SLR
Photography**

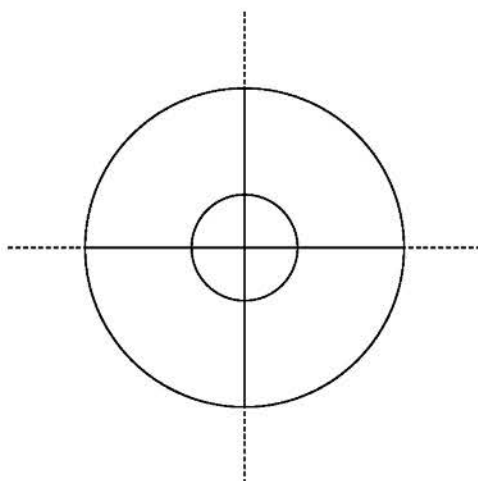


CUT ALONG LINE



WB REFERENCE CARD

**Digital SLR
Photography**



CUT ALONG LINE



Getting started in DIGITAL PHOTOGRAPHY

MASTER YOUR CAMERA!

SETTINGS AND
ADVICE FOR ALL
MAJOR BRANDS
OF CAMERA



Understand your camera

Get back to basics to learn how your DSLR or mirrorless camera takes great pictures



Learn the fundamentals

Grasp those essential skills that help you take top-notch photographs every time



Shoot landscapes like a pro

Take stunning images of the great outdoors with our comprehensive guide to landscapes



Master daylight & flash portraits

Learn how to control daylight and flash and capture your best ever portraits



Use the best budget gear

We reveal the best budget photo kit to help you spend less but still take great pictures



Free colour balance cards

Guarantee perfect exposures every time with our free grey and white cards

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